Expert group joint opinion

Evaluation Procedure: Assessment of Study Field

Higher Education Institution: Riga Technical University

Study field: Architecture and Construction

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Summary of the Assessment of the Study Field and the Relevant Study Programmes

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The experts with support of the Quality Agency for Higher Education evaluated the study field “Architecture and Construction” and 18 study programmes. The evaluation included a self-assessment report and a study visit from 14 to 18 February 2022. In general, the experts recognized the study process as being organized to a high quality level including resources available and academic staff competence. The University provides adequate quality assurance in its operations. Cooperation and Internationalization involves a wide range of cooperation partners, however ingoing and outgoing mobility could be increased. The experts indicate strengths and weaknesses and provide recommendations for each study programme.

In general, all experts evaluate all study programmes as good with some minor weaknesses regarding the information availability to students how to get involved in research projects, unsufficient physical infrastructure for distance learning, low percentage of long term incoming mobility of the teaching staff, necessity for more diversified teaching methods including regular field trips to the enterprises. Some of the experts emphasize that the phraseology of learning outcomes does not reflect the incremental higher order of challenge to the students. In some cases study programme learning outcomes should be revised at all levels. In a view of experts there is low level of involvement of external stakeholders (graduates, employers) in regular surveys. Special attention should be paid to the declining numbers of students for the last 3 years, however some programmes are highly popular. In addition, experts acknowledge that the emphasis is only on certain professional digital software.

The main strengths cover such aspects as annual reviews of the study content, the composition of the teaching staff over the reporting period shows a gradual path, however in long-term demand for such professions could decrease as main strategic building objects will finished (for example, Rail Baltic). Good collaboration among academic staff on one hand, students and employers also underlines the strengths of the study programmes. Overall all experts agreed that the ORTUS platform is well-organized and the technical provision of study materials, instruments, measuring equipment is sufficient. It should be mentioned that the academic staff are supported in developing student-centred practices through continuing professional development courses on pedagogical developments. Students found that the study progarmme Architecture is interesting, students are interested in the study programme, each year all state funded places are taken and there are no indicators that students may stop applying for the study programme. No less important factor is an excellent collegiate atmosphere. Additional advantage is fact that the University provides study programme Geomatics which is unique in Latvia, challenge is sustainability regarding the number of students enrolled.

The recommendations follow from the conclusions such as to increase long term incoming and outgoing mobility of the teaching staff as reponse to weaknesses of low incoming and outcoming of academic staff, develop a procedure and inform undergraduate students how to get involved in research projects as part of their student learning experience as reponse to lack of information how students can be involved in research activities and others.

Regarding the assessment of the requirements for the study field and the relevant study programmes all requirements are fully compliant approving high quality of the contect of study programmes, resources available and teaching staff.

I - Assessment of the Study Field

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1.1 Management of the Study Field

Analysis

1.1.1. The RTU Strategic Plan 2021-2025 includes proactive linking of university activity with the needs of the national economy. This is clearly reflected in the aims of the Architecture and Construction study field at RTU. The goal of the study field's 18 study programmes is to produce graduates in Architecture and Civil Engineering, complying with national professional standards from first professional level to doctoral level, mindful of European and global developments (SAR, p.18, 19). These aims are clearly defined through the European directives, legislation and industry standards, thus dictating measurable programme outcomes. The study direction aims are kept current through ongoing collaboration with the professional associations and industry, both in formal and informal ways. The Expert Group learned time and again of the effectiveness of the close working relationship between RTU and industry colleagues through study commissions, internships and personal contacts which allows each side to keep informed of each other's developments. (Site visit meetings with both academic staff and employers in five different disciplines). The range, breadth and depth of interconnected programmes on offer is logical, such that optimising the number of programmes through addition, deletion and integration, in response to Ministry requirements, has been seamlessly achieved without loss of opportunity to students nor reduction in service to society. The programmes cover the range of levels required by the industry by building capacity from first level professional, to professional bachelors and professional masters. Academic bachelor study programmes are provided in Architecture and in Civil Engineering. Capacity building for both industry and the higher education institutions is provided through doctoral level studies in Architecture, Civil Engineering and Heat, Gas and Water Technology with some examples of industrial doctorates in addition to traditional doctoral studies. The range of programmes covers the current needs of a stable market, although a shortage of graduates in some areas is due to abnormally high short-term demand (SAR, p.20 and site visit meetings with employer representatives from five disciplines). The successful implementation of two joint masters programmes with Vilnius Gediminas Technical University is noteworthy, contributing to the RTU strategic goals of innovation and internationalisation.

1.1.2. RTU performed a SWOT analysis of the study field (SAR, pp.24-26). Notable strengths identified by the University (verified by the Expert Group during the site visit) include the employability of graduates and successful growth of international joint masters programmes. A systematic weakness in Latvia (not unique to RTU) is the practice of students needing to take on significant remunerated employment in parallel with their full-time studies, which negatively influences the university study culture, retention rates and full development of students' potential. Notwithstanding RTU's ever-improving key performance indicators (KPI's) it is losing ground on the international competition in world rankings, which threatens its international reputation. Nevertheless opportunities are recognized in respect of advances in digital infrastructure which may ameliorate or overcome some of current weaknesses. The SWOT analysis has richly informed development planning.
The resulting Development Plan (SAR, p.26 and Annex), with eight activities in response to four key objectives, is informed by both advisory boards involving external members and a comprehensive internal quality assurance and quality improvement system. Comprehensive data sets are assembled based on feedback from students, graduates, academic staff and employers. This is coordinated by a Department of Quality Management and Document Processing who annually provide an analysis of evidence-based trends to decision makers in the development planning process (Site visit meeting with the Director of the Quality Management Unit). This also allows the detection of threats to progress by monitoring performance against key performance indicators (KPI's) provided to senior management and key faculty members. Equally, reports are collated on request to groups such as Advisory Boards and Study Direction Committees from which

opportunities for development are identified and evaluated. A recent example is the addition of an Academic Bachelor study programme in Civil Engineering to increase the inward mobility of international students.

1.1.3. Study field leadership includes oversight of the internal quality assurance system by the Vice-Rector for Academic Affairs, supported by each Head of Study Programme (SAR p.29). The Head ensures that an annual review is conducted by the academic staff of the curriculum and teaching / learning / assessment materials. The academic staff make use of the annual review to inform each other of planned proposals to update courses and identify areas of synergistic overlap or the need to rationalise some material. This is supported in particular by the administrative staff of the RTU Curriculum and Study Programmes Unit and the RTU Study Department (SAR, p.29). The RTU Study Department also supports the programme implementation by providing short courses on pedagogy to interested members of the academic staff. Quality improvement occurs both 'bottom-up' and 'top-down' in the chain of Advisory Board / Study Direction Committees / Faculty Council / Senate / Vice Rector for Academic Affairs. However the number of links in the chain can also lead to inertia, leading to some stifling of innovation and delay in implementing change (evidence from site visit meetings with staff). Alignment of decision-making at different levels is ensured by integration of the annual Faculty strategic goals to the University strategy in an annual agreement, with indicators on which part of the Faculty financing depends. Student input is available at all stages of the process. There is a student self-government at faculty level and representation on all RTU decision-making bodies including 20% of the 50-member Senate.
The administrative and technical staff support to the programmes is good although the speed of response from some administrative units is less than optimal (evidence from site visit meetings with students). The latter may be a further reflection of somewhat bureaucratic structures.

1.1.4. University legal acts, ("Admission Regulations for Academic and Professional Undergraduate Study Programs", "Admission Regulations for Academic and Professional Graduate Study Programs", "Admission Requirements for Doctoral Study Programmes"), regulate the admission processes, as well as procedures for enrolment to various study programmes at higher education institution. Therefore, "Admission Regulations for Academic and Professional Undergraduate Study Programs", (Appendix 30 – List of internal regulations), refers to academic Bachelor, professional Bachelor, first level higher education – college study programmes, while "Admission Regulations for Academic and Professional Graduate Study Programs" (Appendix 32 – List of internal regulations), relates to academic Master, professional Master and professional study programmes. "Admission Requirements for Doctoral Study Programs", (Appendix 34 – List of internal regulations), is applied for enrolment in the frame of doctoral study programmes. A common feature of these acts is detailed presentation of the application procedure, basic admission principles, application requirements, and entrant matriculation provisions.
The admission legal rules are prepared on the basis of various regulations of the Government, (No.846, No.335, No.543), adapted to the specifics of this study field. According to the results of Centralised Examinations in particular subjects, (Mathematics, Latvian Language and Foreign Language), final grades achieved during the secondary education and additionally, the entry test results, the applicants can be admitted to full - time and part - time undergraduate programmes. Additional results, (if prospective students have above - mentioned examinations in Physics or Chemistry), are also included in making the ranking list. Actually, the competition procedure is based on using the weighting method and it depends on the subject, (the rating in Mathematics CE has a crucial influence on the possibility for the state budget funded seats), type of previous acquitted education, when and where it was completed.

The application for state budget funded seats in undergraduate study programmes is organised

electronically, (in the Joint Enrolment Undergraduate Study Programme information system, via https://www.latvija.lv), as well as in combination of electronic application and its confirmation by presenting the original documents “in person”. (For secondary school generations before 2019/2020 and for those who completed their secondary education abroad).

The opportunity for enrolment at the University is also given to the applicants with bachelor’s degree in a field relevant to the study programme. The competition procedure is based on the weighted average grade from the Bachelor or professional study programme.
Electronic application, (University portal ORTUS), for the state funded places on graduate study programmes, is available for applicants who finished their undergraduate studies in the frame of RTU. This opportunity is provided for graduates of undergraduate study programmes from other state – accredited higher education institutions in Latvia. (With summer 2020 admission). Additionally, such applicants can also submit the supporting documentation on-site, (University Admission Committee). This way of submitting the documents is mandatory for other categories of applicants, (who do not apply for above - mentioned seats, who got their previous education abroad as well as different, specific cases). However, the Institution has in view to facilitate the application process, (electronic application), for those who are interested in continuing their studies but do not belong to the above - mentioned categories. (Graduates from abroad, as well as those who do not qualify for the state budget funded places). This way of submitting the necessary documents was planned for the admission process from the summer of 2021.
When it comes to applying for doctoral studies the procedure begins with the approval of the possible scientific advisor/consultant, (through the discussions between the candidate and the Head of the Doctoral Study Programme). The consultant does not have to be from the same scientific establishment, but a written acceptance must be obtained. Additionally, such an advisor should belong to RTU.
The specific regulations for the admission are approved every year, (RTU Senate), and they contain all stages of the process, with precisely defined deadlines and required documents. The phases of the procedure for full - time studies application, (“A Doctoral student may commence studies at the full -time, (day) and part - time (extramural) fee - based Doctoral study programmes, if advanced payment of tuition fee is performed in compliance with the set RTU payment procedures” – 3.7. “Admission Requirements for Doctoral Study Programs” are: submission of documents to the RTU Doctoral Studies Department, forwards them to the Faculty Scientific Committee responsible for making the ranking table, (according to the criteria set by the mentioned Faculty body and approved on RTU level – Vice Rector for Research), submission of the ranking table to Admission Committee of doctoral students, (also approved by Vice Rector for Research). The implementation of the whole procedure has improved since spring 2020.
Regulation on the Recognition of the “Courses completed at Other Universities and RTU Study Programmes”, (Appendix 10 – List of internal regulations), as well as “Procedure for Recognition of Competencies Developed Outside Formal Education or From Professional Experience and Learning Outcomes Achieved in Previous Education at Riga Technical University “, (Appendix 09 – List of internal regulations), are the base for legal recognition of previously obtained formal and non - formal education.
The mentioned regulations towards procedure, process of recognition, deadlines, etc. are publicly available on RTU website - https://www.rtu.lv/lv/studijas/uznemsana/uznemsanas-noteikumi –
in Latvian, intended for domestic students), and on http://fsd.rtu.lv/ (for foreign and exchange students). In accordance with the articles of these legal acts, 12 applications for recognition of previous education or professional experience and equalisation of prior formal and informal education were reviewed in the evaluation period in the study direction of “Architecture and Civil Engineering”.

1.1.5. The SAR notes that the methods, principles and procedures for assessing the learning outcomes in this field are based on the “Regulation on the Assessment of Learning Outcomes”. (publicly available on Studies Regulations page of RTU web page (https://www.rtu.lv/writable/public_files/RTU_studiju_rezultatu_vertesanas_nolikums.pdf (in Latvian). It is a document that regulates the assessment procedures in detail, starting from the definition of terms crucial for this area;general provisions regarding learning outcomes assessment according to the requirements of study courses; give an explanation of various examination procedures; requirements and procedures for settling academic arrears; procedures of examination to improve academic performance; duties of instructors and students during assessment; appeal submission and hearing procedures. In
Appendix to this regulation, “Assessment Criteria for Evaluation of Learning Outcomes according to 10-grade Scale and Assessment ''Tested `` or''Not Tested” is presented. Additionally, summative assessment is put in place, which includes midterm exams, final project, papers, tests, through which the students` knowledge or skills are compared against standards.
Deeper analysis of the study programmes and study courses description, leads to the conclusion that the assessment depends on the level and type of study programmes, type of study courses, learning outcomes that should be achieved.

1.1.6. Uploading the electronic version of graduate papers in ORTUS portal is a mandatory obligation for students who will graduate on RTU study programmes. Thus, after the uploading, the joint computerised plagiarism control system, (used by many higher education institutions in Latvia), checks the papers. In addition to the basic goal directed towards prevention of plagiarism, higher quality of papers as well as updating and managing University bibliographic database is provided. Besides the mentioned system, Turnitin, (integrated with RTU ORTUS e-study system), is a tool which, with two platforms in its structure gives the opportunity for simultaneously detection of plagiarism, as well as correction of submitted papers. Therefore, as a conclusion, it should be emphasised that parallel checking of papers, using both systems is provided.
Advisory Examination Commission is institutional body which is in charge with developing control processes as a part of the assessment procedure on the study programme level - initial check through realisation of interim assessment, such as: examine the electronic version of the submitted work through the system and as a result, making a decision for allowing its defence, (match level of 20% or lower), instructions regarding the consequences of plagiarism given to the students during preparation of graduate papers.
Ethical behaviour of the internal stakeholders, is based on the Researcher Code of Ethics, (since 1997) – (Appendix 19 - List of Internal regulations), Code of Academic Integrity, (Appendix 38 - List of Internal regulations), publicly available on https://www.rtu.lv/writable/public_files/RTU_rtu_studiju_reglaments_7.1.1.4.pdf), “Breach of Academic Integrity and Breach Consideration Procedures”, (Appendix 39 - List of Internal regulations), “Statement of the breach of academic integrity by a student”, (Appendix 40 - List of Internal regulations). The mentioned regulations and documents give legal support in the processes of promotion and further development of academic culture, through detailed explanation of general principles towards sustainable integrity in different areas of University environment. (Research work, behaviour of teachers, students and other employees, breaches of students).
As a member and one of the founders of the European Network for Academic Integrity, (ENAI), RTU uses publication titled as “Glossary for Academic Integrity”, (http://www.academicintegrity.eu/wp/glossary/), in order to promote ethics values in academic area. Various events, (conferences, seminars) towards strengthening the awareness of the importance of respecting the ethical values are organised.
The Dictionary of Academic Integrity Terms and Guidelines is published by University Press. Additionally, three higher education institutions from Latvia, (RTU, University of Latvia, as well as

Riga Stradinš University) – Specific Support Objective, as a part of the project "Development of Efficient Management of Riga Technical University", cooperates in the field of academic integrity, through active involvement in founding of the Latvian national academic integrity organisation and process of further developing of plagiarism control tools.

Conclusions on this set of criteria, by specifying strengths and weaknesses

The aims of the study field are clearly defined through reference to the European directives, legislation and industry standards. The RTU Strategic Plan 2021-2025 includes proactive linking of university activity with the needs of the national economy. This is clearly reflected in the aims of the study field. The programmes cover the range of levels required by the industry by building capacity from first level professional, to professional bachelors and professional masters. Academic bachelor study programmes are provided in Architecture and in Civil Engineering. Capacity building for both industry and the higher education institutions is provided through doctoral level studies in Architecture, Civil Engineering and Heat, Gas and Water Technology with some examples of industrial doctorates in addition to traditional doctoral studies. This is a clear and logical suite of programmes to meet the national needs of the field.
The RTU Development Plan, with eight activities in response to four key objectives, is informed by a comprehensive SWOT analysis and input from advisory boards. A comprehensive internal quality assurance and quality improvement system ensures evidence-based decision making.
Study field leadership includes oversight of annual reviews by the Vice-Rector for Academic Affairs and Head of Study Programme. Reflective analysis and proposed curriculum developments by the academic staff is supported by the RTU Curriculum and Study Programmes Unit and the RTU Study Department. Quality improvement is managed through a chain of Advisory Board / Study Direction Committees / Faculty Council / Senate / Vice Rector for Academic Affairs. However the number of links in the chain can also lead to inertia, due to somewhat high levels of bureaucracy. Opportunities to decrease bureaucracy through LEAN technologies are worthy of exploration.
The expert group is pleased to note that there is a system approach to University students' admission processes. It considers and takes into account the attributes of previous education of applicants through various procedures for recognition of the study period, ("On Procedures for Recognition of the Courses Completed at other Universities and RTU Study Programs"), formal and non - formal education, ("Procedure for Recognition of Competencies Developed Outside Formal Education or from Professional Experience and Learning Outcomes Achieved in Previous Education at Riga Technical University"), as well as admission of the entrants to RTU, ("Admission Regulations for Academic and Professional Undergraduate Study Programs", "Admission Regulations for Academic and Professional Graduate Study Programs", "Admission Requirements for Doctoral Study Programs"). The conditions that need to be met, as well as the steps for successful realisation of the admission processes, are clearly presented and described in detail in the mentioned procedures. They are approved by the Senate and published on November 1, each year. Furthermore, the information regarding study opportunities and admission is available on the RTU website: Riga Technical University | Engineering Center in the Baltics (rtu.lv) The above-mentioned procedures, the way of implementation, target groups to which they refer were discussed during the meeting, (14th of February, 2022), with the person responsible for University QA management system.
Assessment of learning outcomes, (summative system which is characterised with continuous assessment of each task provided in the course description, throughout the semester), is realised following the legal act named as "Regulation on the Assessment of Learning Outcomes", (publicly available on RTU website and provided by the University in Appendix 04 – List of Internal regulations). Additionally, it should be in line with assessment forms and methods of each study course, set out by the teachers responsible for its delivery, (provided in the course description of the study programme). It also should be noted that the assessment criteria are publicly available on

ORTUS e-study system. The Centre of Academic Excellence is in charge with the professional development of academic staff on the University level, while it is also realised on the Faculty level through various courses and seminars.
The assessment methods presented in the study courses description are transparent, feasible and non-discriminatory.
“Code of Ethics of RTU Students, Academic Personnel and Staff”, “Code of Academic Integrity”, “Breach of Academic Integrity and Breach Consideration Procedures”, “Statement of the breach of academic integrity by a student”, (provided to the expert group by the University and available on Course: Academic Integrity and Academic Writing (rtu.lv) in section titled “RTU legislation with respect to ethics and academic integrity”) , are Institutional legal acts and documents which define a set of principles that guide ethical behaviour of internal stakeholders, (students, teachers and other employees), in academic environment. They set out the mechanisms for ethical monitoring and review of all the activities inside this Higher Education Institution. Additionally, various publications and events, publicly available on RTU website, (“Glossary for Academic Integrity”, online seminars, webinars, e-presentations, academic integrity related activities held by RTU student parliament), for academic honesty and mutual respect, are organised. Moreover, the Advisory Examination Commission is responsible for coordinating, determining and maintaining the ethics in the assessment procedures on Faculty level.
Among other, ORTUS portal is used as a tool on which the electronic version of graduates’ papers is uploaded. This students’ activity, (which is mandatory), offers possibility for papers’ check out, as well as strengthening the database of bibliographic records, (through joint computerised plagiarism control system used by many higher education institutions in the country). The capabilities of the system are increased through the use of Turnitin, (originality checking and plagiarism prevention service), which is integrated with RTU ORTUS e-study system.

Strengths:
1. The needs and the development trends of the society and national economy are successfully met through close cooperation with employers, professional associations and the ministries.

Weaknesses:
1. The number of links in the chain of curriculum development can lead to inertia, due to somewhat high levels of bureaucracy.

1.2. Efficiency of the Internal Quality Assurance System

Analysis

1.2.1. According to the SAR, RTU has an internal quality management system in place in accordance with the RTU Quality Policy updated and approved at the meeting of RTU Senate on 25 September 2017, Minutes No 612 and the RTU Excellence approach approved at the meeting of RTU Senate on 30 January 2017, Minutes No 606. RTU structure has a quality management and sustainability unit that works with all the data quantitative and qualitative in regard to the quality management system. There is no separate quality strategy for the Faculty, where different study direction committees oversee the academic processes. The department of quality and risk management consists of 2 people who are responsible for quality and monitoring the performance indicators at the institutional level. The quality management and document processing unit is responsible for proposing new QA policies if and when it is deemed necessary. The Faculty developed the performance indicators at the institutional level. Additionally, each RTU faculty has responsible people for implementing and monitoring QA processes. The quality management and document processing unit itself is small and it is responsible for the EFQM excellence model. The EFQM excellence model is centralised and the Faculty unit Department of quality and risk management is

working on mechanisms in evaluating the information and data. The data (both qualitative and quantitative) from questionnaires given to students, graduates, faculty, employers, etc. are analysed accordingly on a regular basis. The faculty doesn't have a QA handbook because the EFQM model has integrated the QA related policies and processes.
The levels of performance of the Faculty are linked to the university's overall strategic goals. Each year, faculty performance indicators are analysed and linked to the overall strategy.
The Faculty developed the Talent programme – students have an individual study process. If they are found to perform well in a study process, their assessment and position increases through relevant rewarding. The Faculty monitors and assesses the motivation of academic staff, where a motivation system for academics is in place. The academic staff can attend various courses, implement projects with intensified courses and seminars.
The Faculty is using Power BI tool (an e-platform) that allows viewing data for any faculty or course at any moment, where all indicators are visible. The same applies for the academic staff. The tool has different indicators for analysing information and each study programme director has access to this information. Regarding processes, the Faculty has an internal web site where academic staff upload each course and related indicators. Anyone can access this information among the employees. Faculty also have a lot of study process questionnaires for study process, and there is an annual report, both at institutional as well as faculty levels regarding study processes, internships, etc. This takes place each year, where the Faculty are ensuring the correct data are accessible to the relevant faculties. Information related to the process of studies, the content, etc., is collected annually and then analyzed. The indicators are predefined, thus are known and are indicated within the Power BI tool.
The faculty has several indicators measuring the success of each study programme in achieving the learning outcomes. Their performance is measured by our Strategic Management Team.
After a discussion with the QA director it was found that the university does not have a QA handbook, since they apply a decentralised QA approach. The centralised QA approach is good for monitoring quality assurance aspects but current practices are inhibiting the development of personal responsibility in quality culture (integrated quality assurance/quality improvement) at the level of the individual staff member.

1.2.2. Study programme development and revision processes are regulated according to the "Procedure for Application, Elaboration and Amendment of the Study Programmes". Revision of the study programme curriculum is the responsibility of the Study Direction Committee. In order to increase the quality of the study process, the review of the Study Programme all stakeholders are involved. The evaluation team found that the review of the relevant study programmes of the study field are based on suggestions of students, employers, and graduates. According to the interviews with all stakeholders, it was concluded that the Faculty has very wide cooperation with employers associations and other organisations. According to the SAR, academic staff of the Faculty regularly participate in working groups and commissions of the Ministry of Economics, Ministry of Culture, Latvian Builders Association, Latvian Union of Civil Engineers and other institutions.

1.2.3. As stated in the SAR, in the reporting period from 2013-2019, the analysis of students' recommendations and complaints was performed. A new document was approved in 2019 titled "Procedure for Submission and Examination of RTU Students' Proposals and Complaints". A total of 295 complaints/proposals have been received between August 2019 and September 2021, 28 of which have been submitted anonymously. Of the submissions 251 were complaints and problems and 27 were suggestions across nine topics. An analysis of the type of complaints is also found within the SAR. Furthermore, an example is given where the Director of the programme resolved the problem by changing a lecturer that was not up to standards with their duties, after a relevant student complaint. In addition to that, the faculty members and students were found to support this

initiative during the interviews, stating that it helps RTU to improve different key performance indices related to the academic and non academic activities. According to the interviews with QA officers, it was noted that students receive feedback regarding their complaints only in cases where the complaint was not made anonymously.

1.2.4. 28 performance indicators characterising process quality are set within the RTU core activity processes "Organisation and Management of the Study Process". The data are summarised annually for the previous academic year by study level and study programme. The data in the quality review that is submitted to the RTU administration are analysed by study level, faculty and study direction. Indicators of numerous study programmes are compared with the general average RTU level. A study programme quality visualisation tool has been created in the Power BI environment, which is used to reflect Bachelor and Master study programme performance at an academic year with the help of a radar chart. In addition, the RTU Study Department summarises and annually submits until the 15th of October to the Central Statistical Bureau and the Ministry of Education and Science a statistical review "Review of the University, College at the Beginning of Academic Year 20_/20_". All stakeholders are involved in this process. An analysis of surveys was also provided to the evaluation team.

1.2.5. Web pages and e-platforms are used for the dissemination of data. Responsible persons were also provided. (https://www.rtu.lv). After a relevant website visit and inspection performed during the visit, it was found that the RTU has developed and maintains a well functioning website, where all information is provided in both the Latvian and English language. Through this website, prospective students can find information about graduate and undergraduate programmes. After visiting the Civil Engineering webpage, it was found that the information related to the programmes were available in both languages (see Study Programme “Civil Engineering” info in English: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/viewer.html?pdfurl=https%3A%2F%2Fstud.rtu.lv%2Frtu%2Fspr_export%2Fprog_pdf_en.188).

Conclusions on this set of criteria, by specifying strengths and weaknesses

The director of the Department of Quality Management and Document Processing was found to be very knowledgeable and active. The QA procedures are managed by the director that is also assisting the study programmes with the needs of the QA related reporting. The RTU is found to apply QA related practices for monitoring the performance of the study programmes and evaluating the efficiency of remedial actions hence monitoring the procedure of closing the loop.
The RTU has its own quality assurance system which is implemented through the Department of Quality Management and Document Processing, which allows it to follow up on the RTU strategic goals and improve the performance of academic staff and students. RTU provides to the Faculty different tools (EFQM excellence model, Power BI) to help with the improvement of the quality and study process monitoring and management. The “Talent programme” was found to motivate students to improve their learning outcomes.
The development of the e-platform for complaint submission is found to be a very good idea and as the QA related personnel stated during the interviews, it has already begun to make a positive difference at improving the institution.
The evaluation team believes that the Department of Quality Management and Document Processing should consider developing a QA handbook, where all the QA procedures and internal processes should be described. The handbook should then be introduced to staff with suitable training as a tool for personal development of an integrated quality assurance/quality improvement culture at the level of the individual staff member. This will not only help the RTU to better organise the QA activities internally, but also help with future evaluations.

Strengths:
1. There are wide opportunities given to students and academic staff to improve their performance through various courses, seminars and exchange programmes.
2. A functioning complaint system is in place and it is already used by the academic community at RTU.

Weaknesses:
1. The Quality Management System is operating well as a university management oversight tool but is more focused on monitoring than the ongoing development of a quality culture ethos at the level of the individual staff member.

Assessment of the requirement [1]

1 R1 - Pursuant to Section 5, Paragraph 2.1 of the Law on Higher Education Institutions, the higher education institution/ college shall ensure continuous improvement, development, and efficient performance of the study field whilst implementing its internal quality assurance system:

Assessment of compliance: Fully compliant

The University implements its QA standards to monitor and develop its programmes and their efficient performance.

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

The QA policy that the university foresees for a decentralised approach that is monitored be different parties including the director of QA.

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

The Faculty provides supervision of their performance.

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 published.

Assessment of compliance: Fully compliant

The evaluation of students' performance is in place.

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

The staff is assessed according to specific procedures that foresee a full evaluation in order to allow them to continue with the university. The quality of their work is also assessed through this procedure.

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

The collection and analysis of information related to all stakeholders was found to be adequate.

7 1.6 - The higher education institution/ college ensures continuous improvement, development, and efficient performance of the study field whilst implementing its quality assurance systems.

Assessment of compliance: Fully compliant

According to the evaluation, the Expert team found the university to have a sufficient system in monitoring the study field efficiency and performance.

1.3. Resources and Provision of the Study Field

Analysis

1.3.1 The HEI has a clearly defined system of distributing financial support for the implementation of the study field. Its three pillar funding model outlined in SAR chapter 2.3, and both during the site visit of the facilities, the interviews with the management of the study field it was evident that the HEI has invested significant resources in the study field. Moreover, the management of HEI indicates that cooperation with the industry takes place beyond the three pillar funding model by the state, for example via student innovation grants and industrial doctorate programmes.

A system for funding research and artistic creation is clearly defined and consists of several components—first and foremost the research base funding provided by the state and allocated in accordance with performance-based indicators. Secondly, it is complemented by three specifically targeted annual project calls with internal funding provided by HEI. Thirdly, resources from the RTU Research Support Fund are available to support various scientific and artistic activities. (SAR, p.49-50) Experts' conversations with the teaching staff confirmed the fact that this system is implemented within the HEI.

1.3.2. Overall the study field is provided with the necessary material and technical resources for the realisation of its objectives. Students and teaching staff have access to the resources required for meeting the study goals (such as library, scientific laboratories, computer suites, workshops, printing and model making facilities, scientific databases), and a system for provision and renewal of the resources is in place. As indicated by the management of the study field during the visit, most of the scientific equipment is dual use, and its acquisition is financed via state funded programmes as well as internal funding for acquiring and maintaining smaller scale equipment.

Despite the relatively low funding provided for higher education in Latvia, and thus the study field (financial resources available for the study field indicated in SAR, p49), the HEI is making considerable progress in renewing its facilities. During the site visit experts observed the ongoing renovation efforts of the facilities for the study field. Certain study programmes already are accommodated in newly renovated facilities, while others are located in temporary facilities, awaiting the completion of ongoing renovations.

At the same time, it must be noted that further investments are needed for the upkeep of the existing equipment as well as further development of the material and technical resources. This includes the need for regular calibration of technical equipment in labs (a shortcoming noted during the expert visit to the facilities), as well as further investment in the digital infrastructure that goes beyond certain software packages, and develops a more holistic skill set of digital thinking.

1.3.3. The HEI provides excellent access to major scientific paper databases, ensuring access to

state of art research (SAR, p50-52). There are allocated budgets for regularly updating the library database with new printed and e-book volumes, and the protocols for doing so are clearly communicated to both students and teaching staff. It must be noted that the experts' meeting with the academic staff and students, as well as the facility visit (the library) revealed that the system for purchasing new methodological materials is in place, yet is primarily used by the academic staff and not the students.

1.3.4. The HEI has also invested in providing communication and IT technologies, such as providing access to video conferencing platforms, computer labs, software licences, digitised classroom systems, Eduroam high speed internet service, but also deploying its e-study system ORTUS, which includes over 130.000 unique course sites since 2007 (SAR, p56). It must be noted that during the expert visit there were consistent problems with the quality of video conferencing infrastructure, and therefore it might need further improvement, especially if distance learning becomes more commonplace after the end of the Covid-19 pandemic.

1.3.5. Staff attraction and retention procedures are in place, and it has been outlined during the site visit and meeting with the management that there are two general categories of academic staff in the field—scientific staff who are involved with research and teaching, and specialists who work in the industry and are teaching in parallel. Among the challenges, the most notable is the disparity between salary levels in the academic field and the industry. As a state-funded institution (its three pillar funding model outlined in SAR chapter 2.3), the HEI is challenged by the higher salary levels in the industry (evidence from the visit and conversation with the management). RTU is coping with the challenge to some extent—the recently announced tenure-track positions in several programmes of the study field are offering internationally competitive salaries, and are likely to attract a competitive pool of applications. On the other hand, it remains to be seen whether such salary levels are sustainable in the long term, and whether there are sufficient financial resources to implement such pay levels across broader parts of the academic staff.

It was noted during the site visit, that several new tenure track positions specific to the study field were announced recently, and they offer highly competitive salaries in order to further raise the quality of the study field. Furthermore, in the time period between 2018 and 2022, the HEI is implementing SAM 8.2.2 project on "Strengthening of Academic Personnel of Riga Technical University in Strategic Specialisation Areas", which is financed by the European Social Fund, and spans across several study fields, including "Architecture and Civil Engineering". One of the aims of the project is to attract international academic staff (SAR, p230).

1.3.6. Professional and didactic development needs for the academic staff are determined and met via multiple mechanisms. In 2018, the HEI has set up the Centre for Academic Excellence (CAE), which is tasked to "to develop a strategy for the professional advancement of academic staff" (SAR, p15). It organises methodological seminars, including two methodological conferences a year, one in each semester aimed to develop the content of study courses and teaching and learning methods (SAR, p60). Furthermore, academic staff are offered several opportunities to increase their skills and qualifications—they can attend various didactic development courses, specialising in certain topics related to their work. The attendance to these workshops is voluntary, and emphasis is placed on individual responsibility to develop one's skills via the offerings of the institution (as indicated during the site visit meetings with staff). A university-level HR system is used to evaluate and implement measures of staff development, annual meetings with members of academic staff discussing the development of their skills ensure a follow up. Furthermore, as experts learned in the meeting with the management of the HEI, there are skill development plans at faculty level and are evaluated by program directors.

1.3.7. The workload of the academic staff is reasonably balanced. As experts' learned from the meetings with academic staff, while the ratio between administration, teaching and research varies for each member of academic staff, sufficient time is allocated for research and teaching (as indicated during the site visit meetings with the staff). One of the limitations that was discovered alongside was the lack of resources to provide long term staff mobility due to lack of resources for substituting their teaching workload.

1.3.8. The HEI has established and is working on continuous improvement of support systems for students. This takes place on a formal level, via protocols established by HEI, such as Career Development Services, Student Services Centre, Psychological Support Services, as well as other workshops and services aimed for different students (SAR, p66-68). Moreover, experts' interviews with both students and academic staff confirmed that support is also implemented on individual level—the academic staff is responsive in regard to students' individual circumstances, and this is exemplified by flexible time schedules, as well as flexible availability of additional contact time. The site visit conversation with students and graduates confirmed the overall satisfaction with student support provided within the study field.

Conclusions on this set of criteria, by specifying strengths and weaknesses

Overall the HEI offers high quality provision of resources to the study field. It has systems in place for redistributing financial support and provisions, and the availability of resources and facilities confirm that. It has implemented an up-to-date communication and technology infrastructure, that ranges from ORTUS system, to computer labs, library, and access to up-to-date inventory in specific study programmes. Furthermore, this also translates to staffing policies—within the available resources, the HEI is making efforts in attracting new staff and providing certain means of didactic development for the existing staff. Similarly, the students are provided with access to student services, which are to an extent integrated also within the specific study programmes, most notably the career services.

Strengths
1. Evident and ongoing improvement of facilities despite the relatively low funding available to the HEI.
2. Excellent library with access to leading scientific databases, books, and digital materials, and clear acquisition protocols for new materials.
3. Well functioning RTU e-platform ORTUS.

Weaknesses
1. Physical infrastructure for distance learning (videoconferencing) needs improvement.
2. Upkeep of laboratory equipment needs more attention—a regular schedule of inspections and calibration are lacking.

1.4. Scientific Research and Artistic Creation

Analysis

1.4.1. The research in Architecture and Construction is inextricably linked to RTU's strategic goal of supporting national economic development. The relevance to industry is assured through national policy documents and industry collaborations. Regarding the former, the research is informed by Latvia's Science, Technology and Innovation Development policy and Latvia's Research Priorities 2018-2021 (SAR, p.76). Regarding the latter, the Expert Group learned in meetings with employers that the formal and informal links between industry and RTU are very strong ("Latvia is a small

country - we are all colleagues") and this helps ensure that research topics are relevant to industry.
Doctoral study programmes are offered in Architecture, Civil Engineering and Heat, Gas and Water Technology. These programmes are building capacity in both academia and industry. The Expert Group learned in meetings with Directors that the number of industrial doctorates is increasing each year. The team also discovered through meeting with the employers that the industry is providing research infrastructure to RTU in respect of innovative topics such as 3-D printing of concrete structures.
Between 2015-2021, a total of 788 articles were published in journals cited in the SCOPUS database, of which 55.5% were in Open Access publications. A graph of the citations per publication is also given for the 2015-2021 period. The list of research areas that the faculty members are working with is extensive.
The Faculty also manages two scientific journals that are Scopus cited, the "Architecture and Urban Planning" and the "The Baltic Journal of Road and Bridge Engineering". The 2021-2022 journal impact factor of Baltic Journal of Road and Bridge Engineering is 0.909, which was just updated early this year.

1.4.2. Teaching is informed by topical research in both architecture and engineering (SAR p.74). The main research theme in architecture is the Latvian built environment in the context of global sustainability problems. This is studied across six aspects of Latvia's built environment from the scale of the individual residential unit to micro districts in cities to the incongruity of large abandoned military territories (SAR, p.73 and Annex). The topicality of the research themes in engineering is assured by the strong alignment of the research projects with Latvia's Science, Technology and Innovation Development policy and Latvia's Research Priorities 2018-2021 (SAR, p.76). The main research outputs are building material science, structural modeling, heat, gas and water technology, geotechnics, smart structures and building information modeling (SAR, p.70-72).
The Expert Group learned in meetings with employers that the research into the didactics of building information modeling (BIM) informed the teaching of digital technologies such that recent RTU graduates are leading the introduction of BIM into Latvian construction practice. Furthermore, students are involved and participate in scientific conferences, develop publications together with the academic staff, whereas, emphasis is given in supporting young researchers through programmes that are available internally, nationally, and internationally.
See also relevant comments in the paragraph on 1.4.5 below regarding integration of interdisciplinary research projects in the student experience at several levels through the 'Vertically Integrated Project' study course (SAR p.82).

1.4.3. Momentum is building in respect of increasing RTU's international research collaborations, primarily in the context of European-funded projects. In addition to existing Horizon 2020 projects, such as SAFERUP (SAR p.76), the international profile of the academic staff is being supported through membership of COST Actions (SAR p.79). RTU Research Office support funds have been established to facilitate a number of targeted initiatives to enhance RTU's competitive international position. Funds have been allocated to assist researchers publish in highly ranked journals; presentation of research at major international conferences; engaging external contractors to assist in research proposal submissions; H2020 mentorship by the national contact person and hosting workshops of writing research applications (SAR pp.77-78).
Faculties and departments are incentivised to increase their international research output through the RTU funding model for distribution of the state funding (SAR, p.78). The success of this strategy may be ascertained by the doubling in overall output of SCOPUS-indexed publications between 2013 and 2018 (circa 440 to 865) and the output per full-time equivalent from 0.9 to 1.5. In the same period (SAR, p.81). Patent registration is also active each year, peaking at 9 in 2017 (SAR, Annex).
Future developments in enhancing RTU's international research impact and reputation is being built

on a strategy of investment in high quality young talent. RTU has committed several million euros each year to an internal Research Excellence Grant scheme to build research talent around 3-year projects, modelled on the EC ERC scheme. For example, €2.4 million in 2020. The results are encouraging. The initial period (2013-2016) funded the involvement of 88 doctoral and 97 postdoctoral full-time equivalent researchers (SAR, p.82).
Finally, since 2013, the faculty in the Civil Engineering study field organise the international conference “Innovative Materials, Structures and Technologies” (once every two years, 2013, 2015, 2017).

1.4.4. RTU has developed efficient mechanisms for the involvement of the teaching staff in research. The Expert Group found in meetings with management and academic staff that these are well received by the academic staff and functioning well. The underlying principle is one of rewarding the growth in high quality research output through the funding allocation model. Allied to this is a supportive career development structure to nurture the skills and experience of early career researchers.
Research output of professors and associate professors is reviewed every six years and re-election is contingent on satisfactory performance. Research projects are underpinned by competitive funding available through the RTU Research Support Fund to provide for equipment maintenance, conference attendance, doctoral study expenses, patent licensing, etc. (SAR, p.81). Six interdisciplinary themes are prioritised.
The Expert Group noted a very high degree of satisfaction among staff with the fairness of the funding incentives and level of support competitively available to them. Some staff expressed a view that the supportive environment in RTU for their scholarly endeavours was ample compensation for the lower basic salary levels currently available in academia compared to private sector industry enterprises.
It must be noted here that financial support to publish is also available. Six research platforms within the main RTU’s strategic research areas were established in 2013 for fostering inter-disciplinary and inter-faculty cooperation of researchers. An annual action plan and dedicated funding (€90k-€120k to six projects) from the Research Support Fund is made available. In the period of 2016–2020, 16 projects were supported and nearly €300,000 of funding was allocated to the projects.

1.4.5. A significant opportunity has been created for students at all levels to integrate interdisciplinary research projects into their student experience. This is achieved through the ‘Vertically Integrated Project’ free elective study course (SAR p.82). Research groups are assembled from at least three different study programmes and membership of each group is open to students from the Engineering High School of RTU, undergraduates at all levels, masters students and doctoral researchers. Mentorship of each project is provided through a collaboration of RTU and Georgia Institute of Technology, USA. However not all students have informed themselves of such opportunities and so enhanced communication from RTU is required.
The Expert Group learned in meetings with staff that student internship placement opportunities include the opportunity to work in a research laboratory at RTU. Bachelor's degree programmes involve students in actual industry projects and practical research of local interest. For example, the new laboratories that are currently being constructed by a company that employs RTU students, has assigned responsibilities to these students that relate to the design and construction of the new Civil Engineering facilities.

1.4.6. The Expert Group learned through meetings with both university and employer representatives of the strong innovation culture in RTU. The close working relationship between RTU and industry has ensured a synergistic environment which ensures that (a) innovation in industry is reflected in RTU courses and research themes and (b) that RTU graduates contribute to the roll-out

of innovative technologies when they enter professional practice. Among the examples that the Expert Group has experienced during their visit at RTU are a laboratory that performs concrete 3-D printing research, student access to the RTU 'Design Factory', BIM, product development/entrepreneurship courses and international summer school workshops on new technologies (SAR, pp.83-85).

Conclusions on this set of criteria, by specifying strengths and weaknesses

The relevance of RTU research in Architecture and Construction to national economic development and industry is assured through strategic goals informed by Latvia's state development policy and research priorities. This is strengthened by the ongoing and strong links between industry and the RTU.

Doctoral graduate capacity is being built in both academia and in industry through doctoral programmes in Architecture, Civil Engineering and Heat, Gas and Water Technology. The number of industrial doctorates was found to be increasing each year.

Teaching staff is informed by research in both architecture and engineering. The research themes are topical and relevant to Latvia's social and economic development. The research eco-system between RTU, the ministries and industry is synergistic with advances in technologies being facilitated in industry-supported laboratory infrastructure. This is followed by RTU graduates entering professional practice conversant with leading edge technical skills like in the case of the introduction of BIM technology into Latvian construction practice.

The RTU funding model for the distribution of state funds incentivizes academic units to build research strengths. A well-funded strategic investment in RTU's research activity and impact at international level is yielding positive results. In the period since 2013 there has been more than a doubling in overall output of SCOPUS-indexed publications and the output per full-time equivalent has risen by over 65%. The RTU Research Office has targeted initiatives to enhance RTU's competitive international position with funds allocated to encourage research for publication in highly ranked journals; major international conference attendance and membership of European projects including COST Actions. External mentoring is being used by engaging contractors to assist in research proposal submissions, liaison with the H2020 national contact person, and workshops on writing research applications. Annual registration of new patents is an ongoing activity.

In addition to supporting current staff, there is a significant investment in attracting and nurturing high quality national and international early-stage researchers through a Research Excellence Grant scheme, modelled on the EC ERC scheme. The grant scheme supported 88 doctoral and 97 post-doctoral full-time equivalent researchers in its first period of 3-year grants.

Mechanisms for the involvement of the teaching staff in research are functioning well. Growth in high quality research output is sustained through the twin track approach of a funding allocation model and supportive career development frameworks. This is working very well and involves performance reviews of professors and associate professors every six years with re-election contingent on meeting targets. There is a very high degree of satisfaction among staff with the fairness of the funding incentives and level of support competitively available to them.

Students at all levels have an opportunity to integrate interdisciplinary research projects into their student experience through the 'Vertically Integrated Project' free elective study course. Each research group comprises students from at least three different study programmes. Different levels come together, spanning the range from high school students to doctoral researchers. International mentorship of each project is provided through a collaboration between RTU and Georgia Tech. Separately from this, student internship placement opportunities include the opportunity to work in a research laboratory at RTU.

There is a strong innovation culture in RTU, built on the close working relationship between RTU and the industry. Industry innovation is reflected in RTU courses and research themes. RTU graduates

contribute to the roll-out of innovative technologies when they enter into professional practice. This culture is based on the quality of research and development infrastructure, most notably the RTU 'Design Factory'.

Strengths:
1. RTU is building research capacity through a highly effective system of performance-based funding at the academic unit level and a career development support structure at the individual level that is competitive but sufficiently collegiate to gain strong staff 'buy-in'.
2. RTU has introduced an exciting interdisciplinary research project course for students, the 'Vertically Integrated Project', that allows students at all levels to work together under the mentorship of an international group of researchers.
3. Technological innovation is both a reality in the study process and a culture underpinning graduate attributes that is highly valued by the industry.

Weaknesses:
1. Not all undergraduate students are aware of the procedure on how to get involved in research projects as part of their student learning experience.
2. The possibility of using a course specially for the Study Field, similar to the 'Vertically Integrated Project', has not yet been exploited as a way of getting students of architecture, civil engineering and heat, gas and water technology to work together on important interdisciplinary skills before they receive their degree and go into practice.

Assessment of the requirement [2]

1 R2 - Compliance of scientific research and artistic creation with the level of development of scientific research and artistic creation (if applicable)

Assessment of compliance: Fully compliant

The research themes are strategically resourced to align with national research policy and priorities. The relevance and impact of research is maintained at a high level through close collaboration with the industry. There is a strong innovation culture in the teaching and research environment.

1.5. Cooperation and Internationalisation

Analysis

1.5.1. The higher education institution cooperates with different institutions from Latvia, especially with employers like, for example, the Latvian Association of Architects (LAA), the Latvian Union of Heat Gas and Water Technology Engineers, Latvian Union of Civil Engineers and other institutions. The faculty cooperates also with state institutions and municipalities. The cooperation partners are selected in view of the specific features of the study field and the relevant study programmes. Employers appreciate that students participate in internships. Employers think about mentoring instead of teaching - for example, finding models how architects can be involved with professionals. At the moment, the question is how good the students are, and how different they are as good experts and adaptives. The employers are overall satisfied with the learning outcomes of students and graduates. The higher education institution has 578 agreements with other higher education institutions, municipalities and employers for scientific research, internships and/ or guest lecturers. Cooperation with other higher education institutions leads to joint study programmes.

1.5.2. The higher education institution cooperates with institutions from abroad, both for academic

staff and students. The annex to SAR List of cooperation agreements with other institutions states the higher education institutions / colleges from abroad for common international research projects and guest lecturers which gives students a different study approach and new knowledge. Cooperation with non-governmental organisations, scientific institutes, professional associations, industry, and student organisations is also ongoing. The academic staff of the architecture programmes participate in a range of international foundations and implementation of international projects. The Faculty of Civil Engineering is involved in international organisations that promote cooperation between higher education institutions offering programmes in civil engineering (SAR, p.86, 87 and site visit meetings with the directors of the study programmes and academic staff). This ensures further selection of cooperation partners relevant to the study field and programmes. Foreign partners are being selected on the basis of scientific research and matching study fields.

1.5.3. The higher education institution has developed a system and procedures for the attraction of the teaching staff and students from abroad (SAR, p.87, 88 and site visit meetings with the HEI management and the directors of the study programmes). Overall the system is well developed. Nevertheless there is a relatively low percentage of long term incoming mobility of the teaching staff - the majority are brief visits (mainly 1 day, at least in the architecture field, 78 out of 92 incoming lecturers visited university for one week or less). Since the previous accreditation there has been an increasing number of online lectures from abroad (site visit meetings with the directors of the study programmes and academic staff). Teaching staff and students participate in both outgoing and incoming mobility. Still, especially from students, there is an opinion that outgoing mobility possibilities should be more used. The support of RTU mobility consultants is highly evaluated by students. Students would also appreciate having more guest professors (site visit meetings with students).

Conclusions on this set of criteria, by specifying strengths and weaknesses

The higher education institution cooperates with various stakeholders - with employers, employers associations, higher education institutions from Latvia and abroad, municipalities, non-governmental organisations, scientific institutions etc. Besides, cooperation is based on strong justification. Employers confirmed that learning outcomes of students are a good basis for the labour market and employment. Academic staff is involved in a range of international projects, foreign partners are being selected on the basis of scientific research goals and needs analysis. System and procedures for the attraction of the teaching staff and students from abroad is in place and working well except for long term incoming mobility of the teaching staff.

Strengths:
1. Employers are satisfied with the knowledge and skills of students and graduates. In most cases they are prepared for the labour market.
2. The support of RTU mobility consultants is highly evaluated by students.

Weaknesses:
1. Relatively low percentage of long term incoming mobility of the teaching staff, the majority are brief visits.

Assessment of the requirement [3]

1 R3 - The cooperation implemented within the study field with various Latvian and foreign organizations ensures the achievement of the aims of the study field.

Assessment of compliance: Fully compliant

The higher education institution cooperates with various Latvian and foreign organizations not only in educational institutions. The cooperation involves various actors like professional associations, employers, NGOs. etc. The cooperation has strong roots, the main activities are students internships, research activities etc.
Coorperation_agreements.pdf
Foreign students_academic staff.pdf
Mobility by programmes_EN.zip
Incoming_outgoing mobility accademic staff.pdf

1.6. Implementation of the Recommendations Received During the Previous Assessment Procedures

Analysis

Previous recommendations for the study field:
1. From the previous evaluation RTU received serious recommendations to improve their infrastructure, and reconsider how to use branch infrastructure. RTU has renovated most of the buildings, and currently are working on plans for expanding premises. Branches are used as centres of excellence and audiences for students. Recommendations regarding infrastructure are fully fulfilled.
2. The paradigm shift from teaching to learning be implemented is partially fulfilled. Expert team agreed that this recommendation is definitely taken into account but RTU still has room for improvements to this sort of study process. During the interviews not all staff members and students could demonstrate a student centred learning approach, such as students' interests are put first, acknowledging students' voice as central to the learning experience. Another example is that overall educational study courses such as legislation courses can be shaped more to fit the actual legislation framework of each profession that is being taught in study programmes. Currently RTU indicated that this study course is similar to all programmes which underlines students' passive not active role in this teaching process. This contradicts paradigm change from teaching to learning approach.
3. RTU still has to work on interdisciplinary learning activities, since all of the study programmes in this field are closely related. This recommendation is fulfilled but yet again there can be better interdisciplinary projects such as architects working together with engineers and heat, gas and water programme students to create one project from beginning to the end. Such collaborations were praised from all involved parties - students, staff members, alumni and employers. They would also train student soft skill development and work in a team building environment raising the interdisciplinary competencies of students.
4. RTU in collaboration with The Construction Education Initiative Group is also renewing study programme syllabus for civil engineering students, including modules in BIM systems. This recommendation has been fulfilled. During the site visit stakeholders also could indicate some examples on how they are involved in study programme improvements - they can provide professional input about study programme syllabus and learning outcomes during defence of diploma projects and final thesis.
5. Regarding sustainability of the study programmes, that also has been taken into account and for example academic Masters programme in Architecture was closed. Criteria has been taken into account.
6. Sub direction of Heat, Gas and Water study programme degree names awarded have been changed based on previous recommendations. Criteria has been met.
7. RTU has developed a well functioning ORTUS platform which can support distance learning. Not all study programmes can be held in distance learning form, since practical work and interaction with other specialists is of highest value to the profession. This criteria is also fulfilled and taken into

account. Criteria is compliant.
8. RTU also has created procedures for recognition of prior non-formal education or professional experience. During the interviews staff members also indicated and named examples how they have changed and updated study programme outcomes, but in experts opinion they still can be more detailed and specific. Criteria has been met.
9. Regarding student internships, tripartite agreements between student, RTU and employers are created and set in place to ensure achievement of internship learning outcomes. Criteria has been taken into account.
10. RTU has not taken into account requirements for changing enrollment conditions that will create unequal conditions for applicants. The justification is appropriate.
11. Infrastructure improvements have been taken into account. See point 1. Criteria is fulfilled.
12. Academic staff member qualification, skills are improved via projects or staff development systems provided by RTU for example competencies also have been raised through SAM 8.2.2. project. Criteria is compliant.
13. RTU also has created a new study programme academic Bachelor in Civil engineering. University is working in collaboration with ministries and stakeholders to monitor the industry needs and correspond accordingly to them by eliminating or creating new study programmes. Criteria is met.
14. During the site visit students, staff members and stakeholders showed very good English language skills. Overall English proficiency of the RTU can be rated as good. Unfortunately it has been indicated that almost each study programme contains at least some courses, in English language, but students could not confirm this statement. Criteria is partially fulfilled, but this is a minor deficiency.
15. See point 12. And during the site visit staff members provided examples on courses, guest lecturing and other activities to raise their pedagogical skills. Criteria is fulfilled.
16. Equipment has been calibrated and is well maintained. Criteria is compliant.
17. Intern quality assurance system is working better and is evolving into the right directions, but still there is room for improvement. RTU indicated that they have internal agreements about fulfilment of study indicators between each dean and rector, which is revised annually. Criteria is compliant.
18. Students of different study levels from bachelor to doctor are involved in the performance of contract work, projects etc. Information provided by annex 3 and during the site visit.
19. Students have access to an abundance of literature resources via the library. There is no criteria for lowest citation requirements that can be used in final thesis works. This criteria does not influence the study quality since literature in the library is indexed or peer reviewed or comes from industry specialists.
20. Barriers for mobility have been decreased as much as possible. Most of the students during the site visit could provide examples on possible mobility options in Europe, Asia and USA. Individual study schedules are created for students to get the missing or not acknowledged CP. Criteria is compliant.
21. Cooperation with VGTU has been improved with joint study programmes. RTU is working on recognition of existing possible cooperation rather than creating new ones with VGTU.
22. Feedback monitoring and acquiring system is in place and is a part of QA system. Criteria are met.
23. ORTUS has become the most used platform for all internal communication in RTU, evaluation and data collection. The QA department provided examples on how ORTUS is helping for quality assurance.

Regarding study subdirection of Architecture:
New study course development is set in place. Some study courses also are moved to different semesters or their total CP value has been changed. This indicates that study programmes are

undergoing healthy changes. More interdisciplinary environment recommendation has been taken into account but as discussed previously they can be implemented even more. Overall recommendations have been taken into account. And even one MA level Architecture programme was suspended.

Regarding study subdirection of Civil Engineering:
Study process is now more focused on group works, statements supported also by students. Internationalisation and QA integration into the study process is already described under the study field section. Importantly for civil engineering, laboratory equipment has been upgraded and renewed. English language implementation in the study process is undergoing, but not all study programme student representatives could provide examples on which study courses are held in English language. Also support to PhD students has been demonstrated in form of grant. Total amount of grant is 10 000 EUR for each academic year.

Regarding study direction of Geomatics:
Goals and learning outcomes have been updated, but they still can be more specific to help track actual fulfilment of all outcomes. This is mentioned in more detail under geomatic study programmes. Balance between geodesic and land surveying modules has been created. In these programmes students also could not indicate which study courses were held in English language. This definitely should be changed to raise communication level since a lot of geomatic experts are demanded not only in Latvia but abroad as well.

Regarding joint study programmes:
Both programmes now have a uniform quality assurance system which starts from the quality assurance board. This board consists of 3 specialists from RTU and 3 specialists from VGTU in both joint programmes. All other issues have been evaluated under study field recommendations.

Regarding Heat, Gas and water subdirection:
Acquisition of skills and competence at the internship venue based on the knowledge provided by special study courses has been implemented and supported by RTU Senate. Development of an engineering project is introduced into the study process. All materials for learning are accessible to students in the ORTUS system. Laboratory works are more integrated and interrelated into the study process. Access to the library is improved. Other statements are already covered by study field recommendation analysis.

Regarding Transportation Engineering subdirection:
Enrollment minimum criteria has been set in Mathematics to control applicant enrollment for the study programme. Students have been using remote study tools during the study process. To improve the quality of internships also in these study programmes tripartite agreements have been implemented. QA feedback loop has been closed. The QA department provided examples on how students receive feedback about implementations into the study programme. Procedures for recognition of prior professional experience are in place.
Overall expert team agreed that most of the recommendations have been fulfilled, they are taken into account and RTU has reacted on these recommendations, some of them still can be improved, but that does not indicate that this criteria is partially compliant, we look at some of the problems as challenges that have been acknowledged. Data obtained from the ORTUS system and surveys is used to improve study quality.

Conclusions on this set of criteria, by specifying strengths and weaknesses

RTU have taken into account previous recommendations and are implementing them to improve the study field and each study programme. There are some deficiencies, but RTU has addressed them and are still improving and these deficiencies are not that significant to evaluate this section as partially compliant.

Strengths
1. RTU has greatly improved infrastructure, premises are widely used and at some parts are still under construction during the site visit.
2. RTU has created a procedure for recognising previously acquired experience.
3. Library accessibility has improved greatly and available resources are enough for the qualitative study process.
4. The instruments and tools for practical lessons have been updated and renewed.

Weaknesses
1. Not all steps have been taken into internationalisation (Students could not confirm that there are study courses held in English) and interdisciplinary direction (All involved parties liked the idea that students work together on one project and finish it together with another study programme students).

Assessment of the requirement [4]

1 R4 - Elimination of deficiencies and shortcomings identified in the previous assessment of the study field, if any, or implementation of the recommendations provided.

Assessment of compliance: Fully compliant

Previous recommendations mostly have been taken into account, those suggestions that are not fully fulfilled are acknowledged and RTU is still improving them and they can be viewed as challenges for the university not weaknesses.

1.7. Recommendations for the Study Field

Short-term recommendations

Develop a QA Handbook and introduce it to staff with suitable training as a tool for personal development of an integrated quality assurance/quality improvement culture at the level of the individual staff member.

Long-term recommendations

Increase long term incoming and outgoing mobility of the teaching staff, the majority are brief visits.
Look for opportunities to design interdisciplinary group work between study programmes.
Develop a procedure and inform undergraduate students how to get involved in research projects as part of their student learning experience.
Look for opportunities to improve physical infrastructure for distance learning (videoconferencing) and upkeep of laboratory equipment, especially the calibration of instruments.

The transformation from “Teaching” culture to “Learning” culture is a process that has to be implemented more broadly and seriously. Student-centred learning should be embraced more among teaching staff and students.
Learning outcomes should be revised on a regular basis, using different sources for their analysis – students’ achievements, employers’ opinions, latest trends in specific scientific fields and pedagogy etc.
Use a course specially for the Study Field, similar to the ‘Vertically Integrated Project’ as a way of getting students of architecture, civil engineering and heat, gas and water technology to work together on important interdisciplinary skills before they receive their degree and go into practice.
Develop formal mechanisms and regulations for student part time employment during the full time studies.
Reduce bureaucracy as the number of links in the chain of curriculum development can lead to inertia.

II - "Civil Engineering" ASSESSMENT

II - "Civil Engineering" ASSESSMENT

2.1. Indicators Describing the Study Programme

Analysis

2.1.1 The study programme Civil Engineering (41582) is in compliance with the study field and its aims are in line with the strategic objectives of RTU. The study programme complies with Cabinet of Ministers Regulation No 322 Latvian Classification of Education. Currently, this is the only study programme that educates and trains supervisors of road construction works in Latvia.

2.1.2 The first level Professional College Study Programme "Civil Engineering", which is offered in the Latvian language, has been supplemented with courses that provide the programme with two specialisation areas – Supervisor of Building Construction works and Supervisor of Road Constructions works. The study programme foresees full-time studies of 3 years and part-time (extramural) studies of 3 years and 6 months. In order to receive the qualification of this study programme 120 credits are needed to be completed (see Annex 9).

As stated in the SAR, the aim of the study programme is to provide education and training to supervising civil engineers that will satisfy the requirements described by Level 4 professional qualifications. These engineers should be able to perform complex contractor related work, while being able to organise and manage construction works in accordance with the relevant legislation. The study programme developed a management system that is described in www.rtu.lv/content/view/5257/1874/lang,lv/, to assure quality of implementation and learning outcome accomplishment. As stated in the SAR, the study programme follows the requirements of the European Qualifications Framework. The aims, objectives, learning outcomes and admission requirements are interrelated. In order to achieve the aims of the programme, programme learning outcomes are defined (see planned learning outcomes in SAR). Given that the study programme is professional, it offers field trips to the students to further help them develop the required knowledge and skills. The two implementations of the programme were found to be in accordance to the offered qualifications after a successful completion of the programme. The duration and scope of the study programme implementation was found to be reasonable and justifiable for both full-time and

part-time studies.

2.1.3 As stated in the SAR, during the 2017 to 2021 reporting period, The first level programme was changed due to the changes in the Cabinet of Ministers Regulations of 5 April 2016. The title of Construction Organiser in Transport Construction has been changed to Qualification of Supervisor of Road Construction Works, where the title of the qualification in the study programme was also changed. An additional study stream titled Qualification of Supervisor of Building Construction Works was also incorporated so as to make the programme more attractive to students. Furthermore, the study programme has been modified with the addition of courses that provide two specialisation areas, as described in section 2.1.1. The modifications were justified and the rationale behind this change was in line with the market's needs.

2.1.4 The economic and social justification of the programme is evident since the need for more experts in the Latvian market is present. The numbers of students have been declining since the industry has been struck by a relevant decrease in growth. The decreasing number of high-school graduates is also a reason provided within the SAR as to why the students have been declining the last 5 years. It is noted though that the number of enrolled full-time students in 2021 was higher than the one 2020. Nevertheless, this phenomenon of student decline is noted generally across the Baltic region and has external causes that do not relate to the quality of the universities.

2.1.5 N/A

Conclusions on this set of criteria, by specifying strengths and weaknesses

The study programme complies with Cabinet of Ministers Regulation No 322 Latvian Classification of Education, while it is currently the only study programme that educates and trains supervisors of road construction works in Latvia. The study programme developed a management system to assure quality of implementation and learning outcome accomplishment, where it follows the requirements of the European Qualifications Framework.

Strengths:
1. Currently the only study programme that educates and trains supervisors of road construction works in Latvia.

Weaknesses:
1. Declining numbers of students for the last 3 years.

2.2. The Content of Studies and Implementation Thereof

Analysis

2.2.1 The objective of the first level professional higher education study programme Civil Engineering (41582) is to prepare qualified supervisors who can perform complex contractor work and manage construction works in accordance with legislation (SAR, p.433). The programme aims are set out clearly in nine statements setting out the expectations of graduate attributes. The attributes are primarily professional skills and motivation for lifelong learning (SAR p. 435). Compliance with state education standards is assured (SAR, Annex 6). The professional qualification requirements being met (PS-161 and PS-162) reflect the 2021 documents.
The modules comprise general education, specialist topics, humanities, foreign language skill and practical internships. These are interconnected and complementary. Modules are mapped to programme outcomes to ensure that all requirements are met in respect of knowledge, skills and

competence (SAR, Annex 8). The academic staff meet annually, under the guidance of the head of the academic unit, to ensure that any updating of the courses does not lead to duplication. The modules are well integrated and aligned with the programme outcomes through a planning map (SAR, Annex 9 and p.440). All students on the programme take 76 CP's of common modules (compulsory, limited choice, internship, final exam), while diverging into two streams for 44 CP's of compulsory modules dedicated to their chosen professional qualification.
The learning outcomes for each module are set out in a comprehensive descriptor template (SAR, Annex 10). The descriptors are accessible to all relevant stakeholders through the ORTUS platform. The learning outcomes are adequate but could be improved to the benefit of students, those delivering the programmes and all those responsible for challenging the students to achieve their full potential. Specifically, the descriptors set out what the students should be able to do at the end of each module ("the ability to ….") but did not reflect the level of the challenge appropriate to the level of the programme stage. In meetings with academic staff it was clear to the Expert Group that an opportunity had yet to be grasped in framing the language of module descriptors in terms that would challenge students to build on prior learning to bring their education to a new level. Sentences beginning with phrases such as "The ability to …." could usefully be replaced by phrases beginning with "define", "infer", "calculate", "analyse", "evaluate", "design" etc., to reflect the increasing level of expectation from the learners as they progress through the programme.
The programme aims to meet the needs of industry and comply with the requirements for 4th level qualification as supervisor of building construction (PS-161) or supervisor of road construction works (PS-162). Thus the content is topical. Regarding market needs, it may be noted that this is the only programme in Latvia with the supervisor of the road construction stream. Graduates meet the requirement of the Occupational Standard (4th qualification level) of Supervisor of Building Construction Works or Supervisor of Road Construction Works, according to their chosen supervising civil engineer specialisation.

2.2.2 Not applicable to this first level professional higher education study programme.

2.2.3 The study implementation method complies with the Education Development Guidelines 2021-2027 "Future skills for the future society". Lectures are combined with practical classes, field trips and visits to enterprises (SAR, p.439). The Expert Group determined through meetings with students of Civil Engineering programmes that RTU responded in a timely manner to feedback on instances where a lecturer's performance was not satisfactory.

2.2.4 Internships form an important part of the learning process and student experience. The organisation of the internships is highly effective with prior consultation on the capacity of the host to deliver achievable learning outcomes. The Expert Group learned in meetings with stakeholders that internship is arranged with a signed tripartite contract (RTU-student-host) to comply with the requirements of regulatory enactments.

2.2.5 Not applicable to this first level professional higher education study programme.

2.2.6 The final examinations include a qualification paper (SAR, p.439). The Expert Group noted that the final works were strong on a test of knowledge but weak on providing students with an opportunity to demonstrate their ability to synthesise competing agendas in a multidisciplinary project and demonstrate informed judgement.

Conclusions on this set of criteria, by specifying strengths and weaknesses

The programme aims are set out clearly in nine statements setting out the expectations of graduate

attributes in respect of professional skills and motivation for lifelong learning. Compliance with state education standards and professional standards is assured. The modules are mapped to programme outcomes, ensuring that the programme is well integrated.
The learning outcomes for each module are set out in a comprehensive descriptor template and are accessible through the ORTUS platform. The learning outcomes are adequate but could be improved to better reflect the higher order of learning expected from the students as they progress through the programme.
The programme aims to meet the needs of industry and comply with the requirements for 4th level qualification as supervisor of building construction or supervisor of road construction works - the Occupational Standard of Supervising Civil Engineer (4th qualification level).
The study implementation method complies with the Education Development Guidelines 2021-2027 “Future skills for the future society”.
The organisation of the internships is highly effective with prior consultation on the capacity of the host to deliver achievable learning outcomes and a signed tripartite contract between RTU, the student and the host company.
The final examinations include a qualification paper but the final works were strong on a test of knowledge but weak on providing students with an opportunity to demonstrate their ability to synthesise competing agendas in a multidisciplinary project and demonstrate informed judgement.

Strengths:
1. Annual reviews of the study content ensure continuous relevance to the field.

Weaknesses:
1. The phraseology of learning outcomes does not reflect the incremental higher order of challenge to the students as they progress up through the stages of the programme.
2. The final works over-emphasise a test of knowledge rather than the students’ ability to synthesise information and demonstrate informed judgement.

Assessment of the requirement [5] (applicable only to master's or doctoral study programmes)

1 R5 - The study programme for obtaining a master's or doctoral degree is based on the achievements and findings of the respective field of science or field of artistic creation.

Assessment of compliance: Not relevant

Not applicable

2.3. Resources and Provision of the Study Programme

Analysis

2.3.1. RTU funding from the basic state budget is made up of the study base financing corresponding to the list of study programmes and the number of students; it is used to cover such expenses as utilities, taxes, infrastructure maintenance (including data for the Student and Graduate Register), purchase of equipment and supplies, staff remuneration, and funding for research activities.
Analysing the financing procedure of the study programmes and the study directions at RTU as a whole, it can be seen that the state basic budget and local fee-paying student funding, in the long run, are determined taking into account the basic principles established by the state.
The library, material and technical provision and financial provision correspond to specific features and conditions for the implementation of the study programme, create preconditions for achieving

study results and indicate the possibility to ensure a quality study process.
Students learn modern teaching methods using such modern modelling and structural calculations computer programs as Autodesk AutoCAD, Axis, Robot, RFEM, Revit and others.
The ORTUS platform has well-organized teaching materials, literature, curriculum and correspondence with teachers and trainers. Learning outcomes are good.
The measuring instruments purchased by the university and used in the training process are not fully calibrated. Their readings are not completely verifiable. During the test procedure, some measuring equipment is not working or is not ready for operation.
After completion of the construction, the RTU Ķīpsala campus is becoming modern engineering study centre in the Baltic States.
The issue of sustainable development is taken into account in the construction process of the campus.

2.3.2. N/A

2.3.3. The financial provision corresponds to the specifics and conditions of the study programme implementation, creates preconditions for achieving the study results and indicates the possibility to ensure a quality study process.
Minimum number of students to ensure profitability of the study programme:
On the basis of the 2015 Ministry of Education and Science "Study on updating of study costs coefficient in higher education and preparation of proposals for consolidating them", as well as empirical calculations of RTU and according to expert evaluations, in order to ensure profitability of the study programme, the RTU determines the minimum number of students:
For full-time intramural local students: 19 students.
For part-time intramural and part-time extramural local students: 15 students.
For full-time intramural foreign students: 12-20 students depending on the country of origin (i.e., paid tuition fees (European Union, Commonwealth of Independent States, other)).
In order to ensure the effectiveness of study programme, similar study courses are implemented jointly for students of several study programmes (for example, mathematics, general sociology, etc.).

Conclusions on this set of criteria, by specifying strengths and weaknesses

Overall resources and provision of the study programme are compliant for the study programme.
Strengths:
1. The ORTUS platform is well-organized.
2. The technical provision of study materials, instruments, measuring equipment is sufficient and corresponds to the study plan and content.
Weaknesses:
1. The measuring instruments are not fully calibrated and during the test procedure some measuring equipment is not ready for operation.

Assessment of the requirement [6]

1 R6 - Compliance of the study provision, science provision (if applicable), informative provision (including library), material and technical provision and financial provision with the conditions for the implementation of the study programme and ensuring the achievement of learning outcomes

Assessment of compliance: Fully compliant

The study programme has all the necessary provisions for the implementation of the learning

outcomes

2.4. Teaching Staff

Analysis

2.4.1. Bearing in mind the number of the teachers involved in realisation of the study programme Civil Engineering (41582), (13 professors – Doctors of Science, 4 elected associate professors – holding the degree of Doctor of Engineering Sciences, 10 assistant professors, 3 leading researchers and 6 lecturers), as well as characteristics of their professional biographies, (including the number of papers published in journals cited in the Web of Science and SCOPUS databases, 757 in the period from 2013 until 2020. – Figure 3.4.1, SAR, p.454,), can be said that they are in line with the legal requirements related to the implementation of this "First level professional higher education study programme". Additionally, when it comes to its aims and learning outcomes, oriented towards preparing ". . . 4th level professional qualification Supervisors of Building construction works and Supervisors of Road construction works . . .", as well as presented results of the study programme, (SAR, p.430), can be concluded that the mentioned teaching staff is a good base for achievement of the intended learning outcomes. Namely, most of the teachers who are involved in delivery of this study programme received their Doctoral degree in Engineering. Moreover, (which is important for this professional study programme), they are specialists in different disciplines of Civil Engineering, such as: construction sciences, concrete, composite and masonry structures, high-performance concrete, ecological building materials, materials recycling, expertise in building structures, bridge structure safety and durability, dynamic properties of bridges, etc. They are also members of committees of reviewers of scientific journals, professional associations and bodies.

2.4.2. Changes in the composition of the teaching staff are an integral part of working of any Higher Education Institution, including this one. Consequently, according to contents of the Table, (p.457), and comparing the numbers of teachers in 2016/17 academic year, (24), with that of 2020/2021 academic year, (35), it's obvious that the significant changes have taken place, first of all, when it comes to number of professors which increased from 6 to 13. The reasons for this situation are common and refer to promotions, transition from academic position to a leading researcher position, involvement of new industry specialists in study process realisation, retirement, termination of employment due to change of job, (from University to construction sector) – SAR, p.456
In order for timely and efficient adaptation to the mentioned changes, various targeted measures are undertaken. Therefore, it's about: monitoring the progress in the field of Civil Engineering and including new courses in the study programme, strengthening the competencies of teachers in English language through participation on courses, organising the specialised training courses, signing of annual agreement,(containing specific quantitative indicators towards studies, scientific activities and valorisation),with each RTU faculty.
In addition, special attention should be paid to RTU participation in the project titled as, "Strengthening of Academic Personnel of Riga Technical University in Strategic Specialisation Areas", (SAR, p.457), and its main goal oriented towards further professional development of teachers in strategic specialisation of 10 study fields, including this one. ("Architecture and Civil Engineering"). Practical realisation of the project should contribute to: improvement of the qualifications of existing teachers,(among other things), through involvement in internship realised in the frame of business community, taking part of doctoral students and foreign academic staff in activities of teachers already employed at this Institution.
Furthermore, the qualifications of teachers are in line with the requirements presented in Section 39 of the Law on Higher Education Institutions in Latvia.
While the Institution has made progress in moving towards increasing the number of professors, there is still work to be done to achieve the optimal balance between different academic positions,

Professors and Associate professors. (6 teachers on academic position Professors in 2016/2017, 10 in 2020/2021; 5 members of the academic staff on academic position Associate professors in 2016/2017, 4 in 2020/2021).
In order to realistically present the quality level of study programme realisation, the student/faculty ratio should be mentioned. (It's 35/40, which means one member of the academic staff to one student).

2.4.3. N/A

2.4.4. The fulfilment of this criteria is based on the facts and figures regarding professional development of teachers. As it can be seen from the SAR and annexes provided by RTU, various study programmes in the field of Architecture and Construction, are realized by teaching staff with qualifications which (among other things) are based on the requirements within the mentioned criteria.

The analysis of the professional biographies (SAR, p.453) and the Curriculum Vitae in Europass format of teachers - E-platform - Quality Agency for Higher Education (aika.lv) leads to the conclusion that the requirements regarding publishing in peer-reviewed editions, as well as, five years of teachers' practical experience are met. Additionally, scientific research and artistic creation activities of teachers are presented in details in annexes on e – platform (Summary of quantitative data on scientific and/or applied research and / or artistic creation activities corresponding to the study field in the reporting period and List of the publications, patents, and artistic creations of the teaching staff over the reporting period) which show that teachers are also involved in artistic activities (exhibitions, concerts, theatre performances) and creation of patents.

2.4.5. Analysis of the SAR, as well as, the information obtained during the meeting with the teaching staff, lead to the conclusion that various mechanisms for positive impact on the study programme development are used. As a result, students' thoughts, as well as, the alumni opinion are taken into account in processes of study courses improvement.(Confirmed during discussions with teachers and graduates – 15th of February 2022). On the other hand, meetings, methodological seminars, joint study tours, (applying practical case studies in classroom sessions), participation in projects, cooperation with state, municipal, public organisations and professional associations of the construction industry (Latvian Board of Civil Engineers) and participation in Education Section of the Latvian Board of Civil Engineers, (evaluation of courses and study process quality), are additional ways for improvements in study courses delivery and higher level of connection between study courseswithin the study programme. (This was also confirmed in the above – mentioned meeting with academic staff). More details are available in SAR, p.85.

Conclusions on this set of criteria, by indicating strengths and weaknesses

Number of teachers, (24 in 2016/2017, 35 in 2020/2021), with their qualifications, (previous education, academic position, work experience, personal and social skills and competences - provided through participation in scientific research and professional projects, memberships in various association, publishing in journals, especially when it comes to those which are cited in the Web of Science and SCOPUS databases), and student/faculty ratio, (35/40), is in line with the legal requirements. The above-mentioned characteristics are a good base for academic success as a whole, (including the intended learning outcomes).
One of the basic features in everyday working of Higher Education Institutions is change in the composition of the teaching staff. The way in which sustainability of the study programme is ensured in such a kind of conditions, depends on the Institution itself. When it comes to RTU and this study

programme, different measures are undertaken: providing the sufficient number of teachers on appropriate academic position, ensuring the proper conditions for development of their career, (courses, agreements, and projects - “Strengthening of Academic Personnel of Riga Technical University in Strategic Specialisation Areas”).
The design of this study programme is a result of cooperation among teachers who are involved in its realisation. Namely, as it was proved during the discussions with teachers, special attention is paid on fulfilment of study programme aims, through enabling the acquisition of students’ knowledge, competences and skills. Different mechanisms are used for improvement of study courses delivery: taking into account the opinion of different stakeholders about the study programme, (regular surveys), scientific research activites, participation in professional associations and professional bodies, organisation of various events. In accordance with the results of the analysis, it can be concluded that teachers who participate in delivery of this study programme meet the requirements of criteria 2.4.4. (Joint Opinion).

Strengths:
1. The composition of the teaching staff over the reporting period shows a gradual path; there were 24 members of the academic staff involved in the implementation of the study course in 2016/2017, whereas that number was 35 in 2020/2021.

Weaknesses:
1. Although the teaching staff composition is fully compliant to the national regulations, there is an unbalanced situation regarding the number of teachers in the academic position of Professor and Associate professor.

Assessment of the requirement [7]

1 R7 - Compliance of the qualification of the academic staff and visiting professors, visiting associate professors, visiting docents, visiting lecturers and visiting assistants with the conditions for the implementation of the study programme and the requirements set out in the respective regulatory enactments.

Assessment of compliance: Fully compliant

Law on Higher Education Institutions, Latvia, Section 39,
Academic Staff of Vocational Study Programmes

2.5. Assessment of the Compliance

Requirements

1 1 - The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard

Assessment of compliance: Fully compliant

Study programme Civil Engineering (41582) complies with Professional Higher Education Standard (Cabinet of Ministers No. 141) Study programme total volume 120 CP of which at least 43 CP are compulsory part covering overall educational, field theoretical, field practical study courses, at least 50 CP for restricted elective compulsory part, Traineeship at least 16 CP and at least 11 CP for final, state examinations, which include a Qualification Paper. Compliance with the study programme with the State Education Standard Annex No 6. The study programme complies with a valid professional standard, Annex No 7.

2 2 - The study programme complies with a valid professional standard or the requirements for the professional qualification (if there is no professional standard required for the relevant occupation) provided if the completion of the study programme leads to a professional qualification (if applicable)

Assessment of compliance: Fully compliant

Meets the criteria and professional requirements “Regulations of the Cabinet of Ministers on the Classifier of Professions, Basic Tasks Corresponding to the Profession and Basic Qualification Requirements No. 264 (May 23, 2017)” and Professional Higher Education Standard (Cabinet of Ministers No. 141). The study programme complies with a valid professional standard PS-161 "Direction Construction Management", Annex 7

3 3 - 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 561 , Paragraph two and Section 562 , Paragraph two of the Law on Higher Education Institutions.

Assessment of compliance: Partially compliant

Study course descriptions are well prepared and they contain all basic knowledge on the length, syllabus, learning outcomes, and evaluation methods in the study course. Nevertheless, compulsory literature should be revised and updated, because some of the literature is from 1970-2000s'. To create even better study course descriptions in the future RTU can consider adding a table which includes on what lecture, lesson what type of knowledge check will be held, and add more detailed descriptions on what will be learned in each lecture, lesson. Some descriptions contain the title of databases in Latvian See annex: RBKB0_EN

4 4 - The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure according to which state recognised documents of higher education are issued.

Assessment of compliance: Fully compliant

Diploma issued complies with the state legislation. See annex of the study programme: Sample of the diploma

5 5 - 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 Higher Education Institutions.

Assessment of compliance: Not relevant

6 6 - 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 Higher Education Institutions.

Assessment of compliance: Not relevant

7 7 - 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 (if applicable).

Assessment of compliance: Not relevant

8 8 - 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

Academic staff has sufficient latvian language knowledge for implementing study courses, see annex : Apliecinājums - valsts valodas prasme

9 9 - 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 (if applicable).

Assessment of compliance: Not relevant

10 10 - The sample of the study agreement complies with the mandatory provisions to be included in the study agreement.

Assessment of compliance: Fully compliant

Study agreements include all necessary parts set in legislation. See the annex: Studiju līgumi.

11 11 - The higher education institution / college has provided confirmation that students will be provided with opportunities to continue their education in another study programme or another higher education institution or college (agreement with another accredited higher education institution or college) if the implementation of the study programme is terminated.

Assessment of compliance: Fully compliant

The RTU has an agreement with LLU (Latvia University of Life Sciences and Technologies) that in case the study programme will be terminated students will be provided with option to continue studies in LLU. See file Agreement LLU and RTU. RTU in future should provide information about exactly which study programme students can continue their studies. This information also would be beneficial for the students.

12 12 - The higher education institution / college has provided confirmation that students are guaranteed compensation for losses if the study programme is not accredited or the study programme’s license is revoked due to the actions (actions or omissions) of the higher education institution or college and the student does not wish to continue studies in another study programme.

Assessment of compliance: Fully compliant

RTU confirms that they will compensate losses for students in case of termination of study programme. See annex: Confirmation on compensation for losses

13 13 - The joint study programmes comply with the requirements prescribed in Section 55.(1), Paragraphs one, two, and seven of the Law on Higher Education Institutions (if applicable)

Assessment of compliance: Not relevant

14 14 - Compliance with the requirements specified in other regulatory enactments that apply to the study programme being assessed (if applicable)

Assessment of compliance: Fully compliant

RTU has indicated that this study programme complies with Civil Engineering law (Pursuant to Article 13 of the Civil Engineering Law). See annex: Compliance of the study programme with the specific regulatory framework of the relevant sector.

Assessment of the requirement [8]

1 R8 - Compliance of the study programme with the requirements set forth in the Law on Higher Education Institutions and other regulatory enactments.

Assessment of compliance: Fully compliant

All regulatory requirements are met and fulfilled.

General conclusions about the study programme, indicating the most important strengths and weaknesses of the study programme

This first level professional higher education study programme “Civil engineering”, is the only study programme that educates and trains supervisors of road construction works in Latvia. It is offered in Latvian Language.
Its aim is oriented towards providing education and training to supervising civil engineers that will satisfy the requirements of Level 4 professional qualification. The mentioned aim is in line with the RTU strategic objectives. In addition, the study programme is in compliance with the study field “Architecture and Construction”.
There are two specialisation areas in the frame of the programme: Supervisor of Building Construction works and Supervisor of Road Construction works. The type and form of the programme is full-time studies of 3 years and part time, (extramural) studies of 3 years and 6 months.

The study programme complies with Professional Higher Education Standard, (Cabinet of Ministers No.141) and “Regulations of the Cabinet of Ministers on the Classifier of Professions, Basic Tasks Corresponding to the Profession and Basic Qualification Requirements No.264, (May 23, 2017)” - Annex 7 – Compliance of the study programme “Civil Engineering” with the professional standard PS-161, Direction Construction Management and Compliance of the study programme “Civil Engineering” with the professional standard PS-162, Direction Transport Engineering. This document consists of different levels of knowledge (representation level, level of understanding and level of use) required for the performance of basic tasks within professional activity, corresponding study courses and their volume in CP.

Despite the evidenced need for more experts of this profile (economic and social justification of this study programme), the numbers of students has been declining in the last five years (based on the external reasons which do not relate to the quality of the universities in Baltic region). On the other hand, the number of enrolled full-time students in 2021 was higher than the one in 2020.

The aims of the programme are in line with state education standards, the required professional skills and motivation for lifelong learning, while the requirements of the European Qualifications Framework are followed in the processes of assuring the quality of implementation and learning outcomes accomplishment.
The analysis of the intended learning outcomes leads to the conclusion that there is a room for improvement regarding better reflection of the higher level of learning expected from the students as they progress through the programme.
In order to avoid overlapping in some study courses, annual review of their contents is performed. Furthermore, the organisation and realization of the internships are regulated by a contract signed by the University, students and host.

When it comes to the final works, the expert group found that the test of knowledge performance is more than satisfactory, but on the other hand, there is a weakness regarding the students' ability to synthesise information and demonstrate informed judgement.

In the view of the expert team, the library, material, technical and financial provision creates a good basis for achieving study results (ORTUS platform has well organized teaching materials). On the other hand, the experts also found that the measuring instruments are not fully calibrated. Some measuring equipment is not working or is not ready for operation. Number of teachers and their qualifications complies with the legal requirements. Furthermore, the student/faculty ratio (35/40) is good.
This Institution takes measures timely (providing the sufficient number of teachers on appropriate academic position, ensuring the proper conditions for development of their career) for study programme sustainability regarding changes in the teaching staff composition. Moreover, it should be emphasized that the study programme design is based on continuous cooperation among involved teachers.

Therefore, the main strengths observed during the assessment are related to the uniqueness of this study programme in Latvia, annual reviews of the study content, sufficiency of the technical provision of study materials, instruments and measuring equipment, opportunities of the ORTUS platform, and gradual path of the teaching staff composition.
On the other hand, the weaknesses regarding: declining number of students, the phraseology of learning outcomes, insufficient content of the final works, fulfilment of the essential requirements of its structures, measuring instruments which are not fully calibrated and some of them are not ready for operation, as well as relations between the number of teachers in some academic positions (Professor and Associate professor), are the base for further improvement of this study programme.

Evaluation of the study programme "Civil Engineering"

Evaluation of the study programme:

Good

2.6. Recommendations for the Study Programme "Civil Engineering"

Short-term recommendations

The final works project brief should be revised to include a greater opportunity for the student to demonstrate higher order learning appropriate to the level of the programme.

Long-term recommendations

Building on the improvements to date in relation to making the learning outcomes more specific, they should be further refined with phraseology that better reflects the level of the programme and the incremental higher order of learning expected of students as they progress up through the stages of the programme.
Pay attention to the number of teachers in the academic position Associate professor. Be sure that there will be sufficient number of Associate professors that can fulfil the academic position Professor in the academic years ahead.

Look for opportunities to design interdisciplinary group work between study programmes. Use a course specially for the Study Field, similar to the ‘Vertically Integrated Project’ as a way of getting students of architecture, civil engineering and heat, gas and water technology to work together on important interdisciplinary skills before they receive their degree and go into practice.
Compulsory literature needs to be reviewed and updated (especially for obsolete publications from 1970-2000). We recommend not to include obsolete literature sources (older than 20 years) in the subject descriptions. Valid but older literature sources could be included in the list of additional literature sources as needed

II - "Engineering of Regional Development and Urban Economics" ASSESSMENT

II - "Engineering of Regional Development and Urban Economics" ASSESSMENT

2.1. Indicators Describing the Study Programme

Analysis

2.1.1. Professional bachelor study programme “Engineering of Regional Development and Urban Economics” (42581) is a full time study programme with a total length of 4 years and is implemented only in Latvian language. Professional bachelor study programme “Engineering of Regional Development and Urban Economics” fits in and complies with study field Architecture and Construction, with emphasis on construction part.

2.1.2. The total amount of CP in the Professional bachelor study programme “Engineering of Regional Development and Urban Economics” (42581) is 160 CP which equals 240 ECTS. Study programme is regulated and complies with the State Standard for Second – Level Professional Higher Education Cabinet of Ministers No. 512. See annex: Annex 6. Compliance with the State Standard for Education. Admission requirements are General or Vocational Secondary Education. Degree awarded is Professional Bachelor Degree in Engineering of Regional Development and Urban Economics. Qualification to be obtained is Engineer in Development Planning. Study programme aims to provide basic theoretical knowledge and professional skills needed to allow graduates to do development planning engineer's work or continue studies in Master level study programmes. Study programme tasks are oriented on providing practical works for students, to give comprehensive knowledge of urban economics and urbanisation impact on regional development. Students after finishing their study programme can plan, organise and assess the development process of territories independently, taking into account the green economy approach. The study programme, aims, objectives, learning outcomes and admission requirements are interrelated and can be achieved in study programmes realisation time.

2.1.3. The changes implemented since the previous accreditation have not influenced the study syllabus or other aspects. RTU has closed English flow and part-time flow studies due to low demand and insufficient sustainability of the subprogrammes. Study programme has been implemented since 2012, the main goal of the study programme was to provide interdisciplinary specialists who could address urban and regional development issues.

2.1.4. Regarding Latvia's regional development this process is still undergoing changes, so these specialists will be demanded. The alumni are mostly employed in municipal development departments and construction boards, design companies, public administration institutions. (SAR 3.1.3. p. 174). Current student statistics indicate that study programmes are demanded and each

year enrolled student statistics have not dramatically decreased from the previous accreditation period in full time study programmes. Overall student count has decreased but that is due to closing of the part time study version and higher tuition fees for student own funded places. The study programme at some point may lose attractiveness to potential students due to changes after administrative-territorial reform. Main drop out reason is weak knowledge performance obtained in Secondary education. Each year there are 10-15 students enrolled in state founded places and ~ 5 students are funded by their own finances. See annex : Annex 5. Students statistical data.

2.1.5. N/A

Conclusions on this set of criteria, by specifying strengths and weaknesses

Study programme complies with the State Standard for Second – Level Professional Higher Education. Study programme name, degree, qualification awarded are also interrelated. Study programme, aims, objectives, learning outcomes and admission requirements compliments each other and complies within the study field. Graduates of this programme are demanded mostly in Municipalities. Student count in full time studies has not dramatically changed in the last report period, the decrease is due to closing of the part time study programme.

Strengths:
1. The higher education institution provides students with specific knowledge which could be demanded in various institutions.

Weaknesses:
1. In the long term when administrative territorial reform and Rail Baltica projects will be finished, the study programme may become less attractive for possible applicants.

2.2. The Content of Studies and Implementation Thereof

Analysis

2.2.1. The professional bachelor study programme Engineering of Regional Development and Urban Economics (42581) is aimed at providing professional education in “engineering of regional development and urban economics” (SAR, p.175). This is delivered via a multidisciplinary curriculum which entails a mixture of subjects relevant to study goals and the objectives of the programme (total 240 ECTS), including an internship.

The study programme is regularly revised to remain topical, and relate to the existing and potential needs of the Latvian economy. For example, this is exemplified by academic staff focusing studies on the solutions for waste sorting and management, or the impacts of refugees on the urban fabric (SAR, p.176).

The high level of employment of graduates and feedback gained during experts’ meetings with employers suggest that the content of the study programme is relevant to the labour market needs, and the graduates are in demand. Their skill sets are overall good, however employers noted the programme does not give enough knowledge on the working principles of the public sector system (i.e. what is a municipality and how does it work”).

2.2.2. N/A

2.2.3 Overall the study methods are well aligned to achieve the study objectives of the programme,

and student centred learning principles are considered to an extent. According to SAR p.178 and the information obtained during the experts' meeting with the academic staff, a variety of teaching methods are used in implementing the study programme - group work, lectures, discussions, analysis, games, practical assignments and others. It is particularly emphasised that group work is widely used in the implementation of the study programme. (SAR, p.179)

2.2.4 Internship at a company or institution is an integral part of the study programme, and is organised before the students formulate their bachelor thesis to ensure their topicality. It is coordinated by a member of an academic staff at the university as well as an employee of the organisation where the internship takes place. During the meeting with students and graduates, the expert group learned that academic staff and the study programme as a whole provides good guidance to the students in securing internships.

According to SAR p.181, the internships are assessed overwhelmingly positively, citing the good set of skills and capabilities the students possess. Employers have noted the positive impact the graduates have in improving work at their places of internship. At the same time experts' meeting the employers indicated a room for improvement when it comes to some students' ability to work in a multidisciplinary environment. Employers noted that some students may lack the soft social skills for doing this.

2.2.5. N/A

2.2.6. The study programme includes a bachelor thesis project, which is research developed in accordance to a topic defined by the student. The programme has a clear and formalised mechanism of defining the thesis topic and ensuring its relevance to the field, as they mostly focus "on problems of regional and urban development in Latvia" (SAR, p183).

Conclusions on this set of criteria, by specifying strengths and weaknesses

Overall the content of the study programme meets all the relevant regulations, and especially the needs of the industry; it is well composed and allows the students to meet the study objectives and to be much demanded in the labour market. The study programme is regularly revised to remain topical, and relate to the existing and potential needs of the Latvian economy. It is implemented via study methods that are well aligned to achieve the study objectives of the programme, and student centred learning principles are considered to a certain extent. There is a space for improvement in regard to teaching students to work in multidisciplinary environments (including the fundamentals of the public sector in Latvia) and use soft skills in the process. In addition, the study programme includes an internship. According to the information available to experts, this process is is well organized and students receive support from the academic staff. Likewise, the thesis project is developed in accordance to a topic defined by the student and in coordination with the academic staff.

Strengths:
1. The curriculum of the programme includes a broad range of subjects offering specialisation to students.
2. The programme overall provides a good foundation for students to meet study goals and succeed professionally.
3. The programme's focus on multiple learning formats.

Weaknesses:

1. The study content has room for improvement in terms of teaching the students about the workings of the public sector system in Latvia.
2. The students may receive insufficient training in terms of soft skills, providing their ability to work in interdisciplinary environment with multiple involved parties.

Assessment of the requirement [5] (applicable only to master's or doctoral study programmes)

1 R5 - The study programme for obtaining a master's or doctoral degree is based on the achievements and findings of the respective field of science or field of artistic creation.

Assessment of compliance: Not relevant

Not applicable to this bachelor degree programme

2.3. Resources and Provision of the Study Programme

Analysis

2.3.1. The study provision, both informative and material, technical, are compliant for the study programme Engineering of Regional Development and Urban Economics (42581). Informative resources are available from RTU Scientific Library, online databases, e-books, e-journals. A special literature database has been developed for the needs of the study field which has been compiled in accordance with the suggestions and recommendations of the academic staff and the students. (SAR p. 184, 185). There is a procedure developed for convenient ordering of the resources from the library and a procedure for each student to request a limited amount of new materials of special interest (according to info from site visit meetings with the director of the study programmes, academic staff and students). In addition RTU ORTUS e-platform is a significant tool for student and teaching staff communication. ORTUS provides access for each student to all the data of the courses taken during the studies, and gives understanding of the course structure. Both students and teaching staff highly evaluate ORTUS. All study rooms designated for the study process are equipped with multimedia facilities.

2.3.2. N/A

2.3.3. The funding available to the study programme, funding sources and the use of funding ensures full implementation of the study process. However there is always space for improvement. For example as mentioned in the site visit meetings with the students they highly value the importance of cooperation with other professionals (architects, environmental scientists). Joint events like hackathons are important and could be introduced more. The funding and the cost per student has been increasing in the period of the study year 2017/2018 to 2020/2021, and the proportion of state funding has increased as well (SAR p. 186). According to the annex to SAR Funding distribution between the cost items the major part (50%) is used for remuneration, leaving for example the position of purchase and modernization of equipment with 1% and business trip expenses less than 1%. It leaves a question - is such distribution sustainable in the long term as such a great part is allocated for first necessities? The study programme has the minimum number of students to ensure the profitability of the study programme. Each year there are ~15-20 students admitted to the programme. According to the annex to SAR On minimal number of students in study programmes it is sufficient as this is a case of study programme that is strategically important for RTU and the state, thus RTU also ensures the implementation of study programmes with smaller number of students than in general - at least 19 students for first level bachelor's for full-time.

Conclusions on this set of criteria, by specifying strengths and weaknesses

Overall resources and provision of the study programme are compliant for the study programme. There is a decent provision of informative resources and a special literature database for the needs of the study field. Access to it is ensured convenient. At the same time, it is evident that the study programme would benefit from higher funding or distribution of funding providing a greater percentage for positions for joint events and cooperation with other professionals (architects, environmental scientists).

Strengths:
1. Provision of informative materials, availability of library resources.
2. Well functioning RTU e-platform ORTUS.

Weaknesses:
1. The funding available to the study programme, the distribution of it.
2. Number of students barely reaches the standard minimum.

Assessment of the requirement [6]

1 R6 - Compliance of the study provision, science provision (if applicable), informative provision (including library), material and technical provision and financial provision with the conditions for the implementation of the study programme and ensuring the achievement of learning outcomes

Assessment of compliance: Fully compliant

SAR p. 184-186. The study programme has all the necessary provisions for the implementation of the learning outcomes.

2.4. Teaching Staff

Analysis

2.4.1. The professional bachelor study programme Engineering of Regional Development and Urban Economics (42581) is implemented by highly qualified staff. Approximately 32-35 members of elected academic staff have been involved in the implementation of the study programme in the reporting period. Over 2/3 of which are qualified at the level of a doctoral degree. According to SAR p.195, there are 6 professors, 8 associate professors, 10 assistant professors, 4 assistant professors at professional programs, 7 lecturers and 1 assistant. The interdisciplinary nature of the study goals of the programme is reflected in the composition of teaching staff, which predominantly involves both the Faculty of Architecture, Faculty of Civil Engineering and the Faculty of Electrical and Environmental Engineering (SAR, p. 187). The student-academic staff ratio is 2:1 as of the time of composing SAR, which indicates the possibility of a high degree of contact time.

2.4.2 The overall composition of academic staff has remained relatively stable since the beginning of the reporting period. It has been noted both in SAR p.195 and during the experts' meetings that the average age of teaching staff has decreased (except at the level of professor). Furthermore, the renewal of staff and its competencies has been facilitated by traineeship programmes in the industry in order to ensure high quality teaching. Furthermore, the staff is offered courses and conferences to include their qualification.

2.4.3. N/A

2.4.4. Overall the academic staff is involved in the processes of academic research. According to available information, the academic staff are continuously involved in producing research outputs and artistic achievements, and they have taken part in publications and/or relevant practical work experience (Study Field appendixes 2.3 and 2.4, as well as SAR p.184-195).

2.4.5. According to SAR p.197 and experts' meetings with both the director of the study programme and the academic staff, a mechanism for mutual cooperation is established among the staff. Staff cooperation is facilitated by several mechanisms. On a fundamental level this is organised via staff meetings and study programme reviews each semester, and data from quality assurance plays an important part in this process (SAR, p198). Furthermore, internal cooperation between the academic staff is facilitated by didactic development opportunities, including academic conferences, seminars.

At the same time, the expert group noticed in meetings that emphasis on 'soft' team working skills are not emphasised sufficiently, and the reflections among the highly qualified academic staff would benefit from more pedagogical training in terms of facilitating multidisciplinary work among the students.

Conclusions on this set of criteria, by indicating strengths and weaknesses

Overall the staff of the programme is fully qualified in regard to the applicable requirements. As noted in the analysis, the interdisciplinary nature of the study goals of the programme is reflected in the composition of teaching staff, which predominantly involves both the Faculty of Architecture, Faculty of Civil Engineering and the Faculty of Electrical and Environmental Engineering. The experts noted a high degree of motivation and interest in the study programme, and mechanisms of staff cooperation are in place with staffing being reviewed on a semester basis. The average age of teaching staff has decreased in most instances, and the renewal of staff and its competencies is ensured. At the same time, it must be noted that staff would benefit from additional training in facilitating multidisciplinary teamwork and soft skills.

Strengths:
1. The study programme has motivated academic staff for meeting the learning outcomes
2. The multidisciplinary nature of the study content is met with a multidisciplinary group of staff involved in the realisation of the study programme

Weaknesses:
1. The staff are highly qualified in their fields of expertise, but need to further advance their didactic skills in facilitating multidisciplinary teamwork.

Assessment of the requirement [7]

1 R7 - Compliance of the qualification of the academic staff and visiting professors, visiting associate professors, visiting docents, visiting lecturers and visiting assistants with the conditions for the implementation of the study programme and the requirements set out in the respective regulatory enactments.

Assessment of compliance: Fully compliant

SAR, p.187-196 and appendix of the study programme, section 3.2

2.5. Assessment of the Compliance

Requirements

1 1 - The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard

Assessment of compliance: Fully compliant

Study programme Engineering of Regional Development and Urban Economics (42581) complies with Professional Higher Education Standard (Cabinet of Ministers No. 512) Study programme total volume 160 CP of which 89 CP are compulsory part covering overall educational, field theoretical, field practical study courses, 27CP for elective compulsory part, free elective courses 6CP, Traineeship 26 CP and 12 CP for Bachelor's thesis.

2 2 - The study programme complies with a valid professional standard or the requirements for the professional qualification (if there is no professional standard required for the relevant occupation) provided if the completion of the study programme leads to a professional qualification (if applicable)

Assessment of compliance: Fully compliant

There are professional standard requirements for “Engineer in Territorial Development Planning”, this standard is brand new, and full compliance of the study courses has been mapped with the standard. See annex 7. Compliance with the Professional Standard (1).

3 3 - 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 561 , Paragraph two and Section 562 , Paragraph two of the Law on Higher Education Institutions.

Assessment of compliance: Partially compliant

Study course descriptions are well prepared and they contain all basic knowledge on the length, syllabus, learning outcomes, and evaluation methods in the study course. To create even better study course descriptions in the future RTU can consider adding a table which includes on what lecture, lesson what type of knowledge check will be held, and add more detailed descriptions on what will be learned in each lecture, lesson. See annex: Studiju kursu apraksti LV rich0.

4 4 - The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure according to which state recognised documents of higher education are issued.

Assessment of compliance: Fully compliant

Diploma issued complies with the state legislation. See annex of the study programme: diploma paraugs

5 5 - 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 Higher Education Institutions.

Assessment of compliance: Not relevant

Not applicable

6 6 - 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 Higher Education Institutions.

Assessment of compliance: Not relevant

Not applicable

7 7 - 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 (if applicable).

Assessment of compliance: Not relevant

Not applicable

8 8 - 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

Academic staff has sufficient Latvian language knowledge for implementing study courses, see annex : Apliecinājums - valsts valodas prasme.

9 9 - 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 (if applicable).

Assessment of compliance: Not relevant

Not applicable

10 10 - The sample of the study agreement complies with the mandatory provisions to be included in the study agreement.

Assessment of compliance: Fully compliant

Study agreements include all necessary parts set in legislation. See the annex: Studiju līgumi.

11 11 - The higher education institution / college has provided confirmation that students will be provided with opportunities to continue their education in another study programme or another higher education institution or college (agreement with another accredited higher education institution or college) if the implementation of the study programme is terminated.

Assessment of compliance: Fully compliant

The RTU has an agreement with LLU (Latvia University of Life Sciences and Technologies) that in case the study programme will be terminated students will be provided with the option to continue studies in LLU. See file VienosanÉs_LLU un RTU_Arhitektura_buvnieciba. RTU in future should provide information about exactly which study programme students can continue their studies. This information also would be beneficial for the students.

12 12 - The higher education institution / college has provided confirmation that students are guaranteed compensation for losses if the study programme is not accredited or the study programme’s license is revoked due to the actions (actions or omissions) of the higher education institution or college and the student does not wish to continue studies in another study programme.

Assessment of compliance: Fully compliant

RTU confirms that they will compensate losses for students in case of termination of study programme. See annex: Apliecinājums - par zaudējumu kompensāciju.

13 13 - The joint study programmes comply with the requirements prescribed in Section 55.(1), Paragraphs one, two, and seven of the Law on Higher Education Institutions (if applicable)

Assessment of compliance: Not relevant

Not applicable

14 14 - Compliance with the requirements specified in other regulatory enactments that apply to the study programme being assessed (if applicable)

Assessment of compliance: Not relevant

Not applicable

Assessment of the requirement [8]

1 R8 - Compliance of the study programme with the requirements set forth in the Law on Higher Education Institutions and other regulatory enactments.

Assessment of compliance: Fully compliant

All regulatory requirements are met and fulfilled.

General conclusions about the study programme, indicating the most important strengths and weaknesses of the study programme

Overall, the professional bachelor study programme “Engineering of Regional Development and Urban Economics'' fulfils all the relevant requirements. Students can obtain Professional Bachelor Degree in Engineering of Regional Development and Urban Economics and qualification of Engineer in Development Planning. Due to dynamic changes in Latvia’s regional development study programme is very topical. This study programme is based on multiple learning formats and offers an overall good foundation of knowledge to students about economic influence on regional development. Its academic staff is motivated and corresponds to the multi-disciplinary nature of the program. Only insignificant shortcomings have been identified. For example students may lack opportunities to train their soft skills, the need of interdisciplinary collaboration and teamwork with other students in the curriculum should be implemented and training of the teaching staff to ensure this. Furthermore, in a broader timeline the topicality of the program should be reconsidered after the expected completion of the national administrative territorial reform in Latvia, hence this could lead to decreasing amount of students into the programme.

Strengths.
1. Study programme currently is very topical and may attract a lot of students if advertised properly.
2. Study programme curriculum is braod and allows students to get acquainted with a lot of different subjects beneficial for the profession.
3. Highly motivated staff with different backgrounds can provide diverse inputs into the study process, that are beneficial for future work training.

Weaknesses.
1. Soft skills training may not be sufficient, taking into account how much graduates have to work in public sector.
2. Student amount already barely reaches the minimum set by the RTU for the programme to be sustainable.

Evaluation of the study programme "Engineering of Regional Development and Urban Economics"

Evaluation of the study programme:

Good

2.6. Recommendations for the Study Programme "Engineering of Regional Development and Urban Economics"

Short-term recommendations

Long-term recommendations

Include a course that teaches the fundamentals of the public sector system in Latvia.
Include topics of soft skills, such as interdisciplinary collaboration and teamwork in the curriculum.
Train staff in terms of their didactic skills for facilitating multidisciplinary teamwork settings
Find avenues of attracting more students, so the minimum student number is exceeded
Monitor and analyse student statistics dynamics and develop potential mechanisms to prevent the risk of the programme becoming less attractive when administrative territorial reform and Rail Baltica projects will be finished.
Ensure the long term development strategy of the study programme beyond the time horizon of both the administrative territorial reform and Rail Baltica projects
Seek ways of increasing the funding available for the implementation of the study programme

II - "Geomatics" ASSESSMENT

II - "Geomatics" ASSESSMENT

2.1. Indicators Describing the Study Programme

Analysis

2.1.1. This Professional Bachelor Study Program Geomatics (42581) is accredited in May 2017. It is developed in accordance with the Law on Higher Education Institutions of the Republic of Latvia and the Classification of Education of the Republic of Latvia.

The compliance of this study program with the study field, “Architecture and Construction” can be assessed by comparing their goals. Namely the aim of the study field is, (“ . . . to provide comprehensively trained professionals in the field of architecture and civil engineering for the Latvian national economy, for working at public and private sector institutions of various levels, by promoting their inclusion on the labour market in compliance with the nationally developed standards of professions . . . “, SAR,p.18). On the other hand, the goal of this study program is, (“To provide bachelor's professional higher education surveying, cartography; to provide professional education in the subfield of geomatics; in accordance with the approved professional standards. . . “(SAR, p. 579).

In order to harmonise this study program with the study field , the revisions mentioned below are made.
Aims and learning outcomes were revised in the direction of additional describing the intended skills and competencies of graduates, bearing in mind the development plans of Latvia and Baltic Sea region, requirements of the labour market, European Union priorities, national education

development, policy and regulations, the vision defined in the frame of the Strategy of RTU.

Consequently, learning outcomes are being revised once a year, the content of the study courses is improved, discussions regarding the study program and its elements are realised (meetings of the organisational units and the Industry Committee). In direction of planned works for this profession in Construction Industry Profession Card, the changes made so far are incorporated into the study program and study courses (Improving of learning outcomes in study course titled “Practical Placement”; Implementing of study course “Fundamentals of Land Management” in English) – “Report on the Implementation of Recommendations for the Study Programme “Geomatics”, Annex 3.

Opportunity for participation in the international exchange program Erasmus+ for full-time students is offered.

2.1.2.The title of this program is Professional Bachelor Study Programme “Geomatics”, classification code, (42581). It is created according to the Law on Education, the Law on Higher Education Institutions, Law on Vocational Education and the decision “On Uniform Requirements for Study Programs of Riga Technical University”. Legal act, “Regulations on the second level professional higher education state standard” is a base for definition of study course results, bearing in mind the above-mentioned goal, tasks of this study program (“To provide students with extensive, professional, practical education, enabling them to adapt easily to the labour market, as well as, scientific research; to provide students with theoretical and practical training appropriate to level 6 of EQI, enabling them to obtain the qualifications, as well as to continue education at Master study program.” – SAR, p.580) and intended results (“Graduates . . . knows the requirements of regulatory enactments, surveyor certification process, is able to independently perform work tasks, is able to plan and organise work, use different methods and technologies, is able to conduct research in accordance with the level of professional bachelor studies, to carry out scientific research and develop new forms and methods in geomatics, is able to defend and substantiate the results of research work”,SAR,p.580). The structure of the study program is as follows: 50% of compulsory study courses, 23 % compulsory elective study courses, 6% free elective study courses, 14% professional practice, 7% final examination paper, in total, 180 ECTS. 84% of the total amount of the program refers to the professional courses of the branch, which complies with the title, goals and learning outcomes of this program.

The qualifications awarded in the study program are included in the ESCO (European Skills, Competences, Qualifications and Occupations) catalogue - a professional bachelor's degree in geomatics and a fifth level professional qualification (6th EQF) - “Geodesy and Cartography Engineer” (the 6th level of the European Qualifications Framework (EQF) and the 5th professional qualification level of the Latvian Qualifications Framework (LQF) and is achieved). As understood, the professional Bachelor study program “Geomatics” is unique in Latvia and there are no analogue programs in the European Education Area. There are only a few similar programs.

The study system at the university is internally regulated by the documents regarding the relationship between students and the university and the documents regulating the course and organisation of studies, which are available at the program administration and virtually on the RTU website (upload the lesson topics for lecturers, practical work, laboratory works, as well as the requirements for successful assessment of the subject).

2.1.3. The latest corrections to the study program are closely related to the requirements of the professional standard (geodesy and cartography engineer), (after their evaluation by the

Construction Industry Expert Council, have been included in the Construction Industry Qualifications Framework), so they are still to be developed and implemented in descriptions of study courses.

Detailed explanation of the improvements and corrections of the study programme is presented in Annex 3, "Report on the Implementation of Recommendations for the Study Programme "Geomatics".(uploaded on e-platform). This document consists of: recommendations of the expert group; activities of RTU; results to be achieved, deadline for implementation. For example, when it comes to the recommendation, it can be mentioned the necessity for more precisely defining the programme's objectives; reviewing of learning outcomes regarding the relation between programme goals and required skills and competencies; better balance of geodesy and surveying modules, etc. Additionally, changes were made in study type and form. During the assessment period, full-time and part-time extramural studies, offered in Latvian were put in place.

Additionally, changes were made in study type and form. Namely, during the assessment period, full-time and part-time extramural studies, offered in Latvian were put in place. On the other hand, it should be noted that one or more study courses are organised in English (study course titled as "Fundamentals of Land Management" in 2018/2019 academic year).

2.1.4. Bearing in mind the above-mentioned goal of this study program, it is important to note that graduates can continue their professional career on master's studies (master geodesy and cartography related theories, consistent patterns and technologies).

Furthermore, the organisation of the study program, contents and delivering of study courses, assessment of learning outcomes, are based on the results of analysing the labour market demands and possibilities of universities/colleges for education of such a kind of specialists. Namely, as presented in the SAR, graduates of the study program can start their individual career or continue since they are able to demonstrate comprehensive knowledge of facts, theories and patterns, necessary for personal growth and development, civil participation, social integration and further education; know technologies and techniques needed for fulfilment of learning or work tasks; are able to plan and organise work processes using different methods, technologies, tools and materials for fulfilment of tasks; are able to find, evaluate and use creatively the information in learning or professional tasks and for problem solving; are able to develop autonomously and improve their professional skills.

Based on the analysis of the employment opportunities, in Latvia and other EU member states, it can be concluded that graduates of this study program can be employed at numerous national institutions and companies, as well as in international organisations (confirmed by the employers – meeting on 16th of February 2022).

The analysis of the number of students, enrolled in academic years in the frame of the period relevant for this Expert Joint Opinion (SAR, p. 589), indicates significant fluctuations: larger number of students in the first years (103 in 2014/2015, 106 in 2015/2016), after which, the number continuously decreases (the exception is 2020/2021, which shows, compared to the previous 2019/2020 an increase in the number of students by three - from 66 to 69). On the other side, it should be noted that during the entire analysed period, the number of state budget seats has not increased.

When it comes to the proportion between full-time and part-time students (SAR, Figure, p.590), it's obvious that full-time students dominate.

The trend is quite different when it comes to comparing the number of full-time and part-time tuition fee paying students. The percentage of the latter is higher in all academic years in the frame of the analysed period (2014/2015 – 2020/2021). Reasons for mentioned are mainly based on difficulties for full-time students to find full-time jobs, as well as move from one type of study to another (about 10% of the total number of full-time students per year).

If the analysis of the number of students is performed according to the ways of financing the study, it will be noticed that the largest number of students (during the entire analysed period) are state budget financed (SAR, p.590). The reasons for this situation are lack of ability for paying the study costs, the loss of job during the pandemic, payment of tuition fees by employers.

2.1.5. N/A

Conclusions on this set of criteria, by specifying strengths and weaknesses

This study program is unique in Latvia. Moreover, there are only a few similar programs in the frame of the European Education Area.

In order to achieve the compliance between this Professional Bachelor Study Program and study field “Architecture and Construction”, aims and learning outcomes of the program were revised. The basis for that process were RTU vision, current situation and directions for future development of national education, its legal acts, priorities of European Union, requirements of the labour market.

Mutual cooperation of teachers in regular review (once a year) is to upgrade study courses, (study program objectives, its content, intended learning outcomes, ways and criteria for knowledge assessment, methods for monitoring the quality in delivering of courses). As mentioned, improvements in several study courses and study programme as a whole are made (Members of the Industry Committee are also involved in this process). Furthermore, study type and forms are changed (full-time and part-time extramural studies, offered in Latvian were included), and delivery of several courses in English language are organised. Development of Erasmus+ mobility program for full-time students is observed.

Several national legal acts and regulations (Law on Education, the Law on Higher Education Institutions, Law on Vocational Education and the decision “On Uniform Requirements for Study Programs of Riga Technical University”, “Regulations on the second level professional higher education state standard”) were used for improving the level of connection between crucial characteristics of the program: title, code, degree, professional qualifications, goals, tasks, intended results, admission requirements. In addition, the structure of the program in relation to different types of courses (compulsory, compulsory elective, free elective), involvement of professional practice, is analysed. The total workload is 180 ECTS, the degree and professional qualification to be acquired is “Professional Bachelor Degree in Geomatics” and “Engineer in geodesy and cartography” (Included in the ESCO catalogue, the European Qualifications Framework (EQF) and in the Latvian Qualifications Framework (LQF).

The duration of studies (full time – 4 years 6 months, part time extramural studies – 5 years), and language in which they are offered (Latvian) are justified and based on the national and European requirements in education and labour market.

Future development in the field of geodesy and cartography was the direction and support for corrections in the study program’s characteristics (already included in Construction Industry

Qualifications Framework). Various forms of knowledge assessment in the frame of different study courses (mainly based on inter-course learning approach) are publicly available in ORTUS e-learning environment.

The results of students' achievements are subject of regular discussions (twice a year at the meetings of the Board of the Institute of Transportation Engineering). State Examination Commission provides information regarding the contents and public presentation of the Bachelor papers (report submitted to the program administration). Moreover, it's a useful support and justification for improvements made in the processes of achieving the intended learning outcomes.

The opportunity to continue studying on master geodesy and cartography related theories, consistent patterns and technologies, is a good social support and justification. On the other hand, the economic justification of this study program is based on the national labour market requirements, as well as, the demands for such a kind of specialists in the framework of the European Union. In addition, the number of enrolled students is also an important economic indicator (significant fluctuations in the period of 5 years) are observed. Furthermore, the number of state budget seats has not increased, full-time students, part-time tuition fee paying students and state budget financed students dominate.

If the above-mentioned characteristics remain in force, the sustainability of this program may be called into question.

Strengths:
1.This study program is unique in Latvia.

Weaknesses:
1. The program sustainability regarding the number of students enrolled.

2.2. The Content of Studies and Implementation Thereof

Analysis

2.2.1. The content of the professional bachelor programme Geomatics (42581) is topical and generally related to the discourse in the field. This is ensured by cooperation with professional and international associations. Furthermore, this is ensured by a curriculum (professional bachelor programme "Geomatics", appendix 3.2) that covers the requirements set in binding provisions. The meetings with the academic staff and the director of the programme confirmed that the revision of study content takes place annually.

The programme is available both in full time (4 years 6 months) and part time (5 years). It must be noted that during the meeting with the director of the programme, it was indicated that in the part time programme the self-study part is expected to take place over weekends and that while the overall study outcomes are the same, in practice the part time students tend to develop higher practical skills, and sometimes lacking theoretical knowledge.

The curriculum consists of 50% compulsory courses, the rest is made of electives, internship, and bachelor thesis and final examination paper. Thematically, the content of study courses is interconnected and complementary to each other. This curriculum is supplemented by regular guest lectures, seminars, and conferences that take place at HEI (SAR, 593-595).

Programme's compliance with relevant regulations and standards is assured at SAR, p.585, and it is

considered unique in Latvia. Furthermore, there are only a few similar programmes in the European context (SAR, p.587), which is said to indicate its competitiveness in the overall offering of higher education. At the same time, during experts' meetings with the students, graduates, and representatives of the programme it was noted that the dropout rate is high, and application rate relatively low.

2.2.2. N/A

2.2.3. The expert group observed that student centred learning is implemented. According to SAR, p.596, the learning in the programme is based on dialogue and active involvement of students in the improvement of the study process. This was confirmed by the students and graduates who indicated close communication between all the involved parties, and the existence of mechanisms of mutual feedback and continuous improvement. At the same time, SAR p.597 indicates field trips as one of the pedagogical approaches, however meetings with students confirmed that there is a considerable space for improvement of having more frequent field trips and other pedagogical methods of exposing the students to the realities of the industry.

2.2.4. Internships are organised in relation to the study goals and are an integral part of the curriculum. Most notably, the objective of the internship is to ensure the combination of theoretical knowledge and practical experience. Students' search for available openings is supported both by Career Support and Services Department (SER, p.603), as well as informal assistance by the teaching staff. The internship is finalised by a public presentation and the prior writing of an internship report during the internship.

2.2.5. N/A

2.2.6. The final thesis consists of the final bachelor paper that explores relevant challenges of the scientific field. The relevance of the paper is ensured by a public presentation of the thesis to the examination commission which includes industry representatives. According to the information obtained during the experts' meeting with the graduates and employers, the thesis topics are relevant to the professional field

Conclusions on this set of criteria, by specifying strengths and weaknesses

Overall the content of the study programme meets all the relevant regulations, and especially the needs of the industry; it is well composed and renewed regularly. It allows the students to meet the study objectives and participate in the labour market. At the same time, the space for improvement remains in terms of more diversified study content, most notably in relation to the exposure to the industry. Student centered learning is implemented and takes central role in programme's self-evaluation, including mechanisms of evaluation. Internships are a part of the study programme and are organised in relation to the study goals and coordination with the academic staff. Likewise, the final thesis project is related to the relevant challenges of scientific and professional field.

Strengths:
1. Student centred learning observed
2. The programme maintained to be relevant in both international and national contexts
3. Thesis projects bear strong relevance to the field

Weaknesses:
1. Full time employment by most students in both full and part time programmes make the

qualitative distinction between the two programmes unclear.
2. More diversified teaching methods including regular field trips and exposure to the industry beyond the internship.

Assessment of the requirement [5] (applicable only to master's or doctoral study programmes)

1 R5 - The study programme for obtaining a master's or doctoral degree is based on the achievements and findings of the respective field of science or field of artistic creation.

Assessment of compliance: Not relevant

Not applicable to this bachelors degree programme

2.3. Resources and Provision of the Study Programme

Analysis

2.3.1. Study programme Geomatics (42581) is supported by the Department of Geomatics, which is a part of the Faculty of Civil Engineering. Since this is a professional study programme, a large amount of lessons are focused on training student skills in different situations regarding geodesy, surveying, levelling, calculations etc. Students have access to a geodetic survey tool laboratory, which provides students with an abundance of different tools such as - Levelling instruments, tachymeters, laser scanners, gravimeter, drones with different cameras and sizes, GNSS receivers etc. All this equipment was demonstrated and shown during the site visit. Students confirmed that if they need they have the access for this equipment to complete research works, complete assignments and utilise them during field trips. Equipment was with different levels of sufficiency. In first study periods students are taught to use the most basic tools to practice and learn their basic principles and slowly they are using more sophisticated tools that are usually electronically controlled. Obtained data can also be transferred to a 3D environment, and as an example a geodesy laboratory showed 3D projection for the RTU premises. Most of the instruments are dominated by the Leica company but a big opponent for delivering technologies is also Trimble technologies. To analyse and work with data students have access to special software licences, such as - ArcGIS Pro, Leica Infinity, Bentley Microstation. All learned skills are relevant to the industry and most of the students start to work in industry during their studies.

Regarding laboratories, lecture halls, they are sufficient for the student amount and can provide students with a necessary study environment. Students have access to the premises of the whole faculty. See SAR 3.3.1. p. 608. Regarding informational base and support for the study process each year the library purchases new books which include the latest developments of the industry and students can lend the books from the library. Besides that RTU has a huge library with paper books and e-resources including database subscriptions such as Scopus, Web of Science, ProQuest Ebook central etc., which can be accessed or ordered on site or through ORTUS platform. Library premises also have been renewed and since the repairs more students have been attending the library. All the most important information and communication is held through the ORTUS platform. ORTUS is an excellent platform for providing all necessary materials and tests for the students and is flexible to organise study work for the lecturers. ORTUS also includes anti-plagiarism tools such as Turnitin, which can check student works with available internet resources and databases. This tool is also used to evaluate plagiarism for the final thesis. All internal agreements, communication and inquiries etc. can also be organised and managed via the ORTUS system.

2.3.2.N/A

2.3.3.RTU has determined that for the successful implementation and profitability of the study programme each study year has to contain at least 19 students in second level professional study programmes annex: On_minimal_number_of_students_in_study_programmes. Based on this study programme student statistics annex: On_minimal_number_of_students_in_study_programmes each year there are approximately only 20 students enrolled most of them are in state founded places ~18 and 1-2 places are usually covered by private funding, in last academic year only 4% of the students were paying studies by themselves students who are not state funded usually are in part time version of the study programme. Student interest in the study programme has not decreased and in last year it was higher than usual, because 27 students were enrolled in the programme.

For the full time study programme there are 20 state funded places information obtained from RTU webpage : https://www.rtu.lv/lv/studijas/visas-studiju-programmememas/atvert/BCE?department=24000&type=P. The web page also indicates that tuition fee is only 1500 EUR which contradicts actual cost per student. RTU should raise the tuition fee for the part time study programme to be sustainable. Factual average cost per one student in this study programme is calculated 2909,45 EUR in 20/21 academic year annex: Studiju_programmememu_finansejuma_sadalijums. RTU in SAR 3.3.3. p. 615 indicates that Financial resources of the study programme “Geomatics” are sufficient for the study programme implementation and their usage is controlled regularly both on the part of the administration, and on the part of the RTU Vice-Rector for Finance.

Conclusions on this set of criteria, by specifying strengths and weaknesses

Study programme has all necessary tools, resources and premises to achieve study programme tasks and goals. Tools are up to date and can provide basic knowledge to students. State funded places can cover actual student costs and make the study programme sustainable. Library resources are enough and can provide students with all necessary knowledge about geomatics.

Strengths:
1. Students have access to the most modern and sophisticated measuring, surveying tools.
2. RTU provides students with licenses for the analysis of acquired data.

Weaknesses:
1. Not all state funded places are filled by students.

Assessment of the requirement [6]

1 R6 - Compliance of the study provision, science provision (if applicable), informative provision (including library), material and technical provision and financial provision with the conditions for the implementation of the study programme and ensuring the achievement of learning outcomes

Assessment of compliance: Fully compliant

Premises, tools, financial flow is calculated and sufficient for the implementation of the study programme. Available resources enable students to achieve learning outcomes and successfully prepare final thesis.

2.4. Teaching Staff

Analysis

2.4.1.Teaching staff currently involved in realisation of the study programme Geomatics (42581)

consists of those who are elected to the academic positions at this University, 1 guest lecturer, (confirmed by the Director of the study programme - meeting on 16th of February 2022) - in the form of exchange between universities, as well as representatives from the enterprises, doctoral students, teachers who are working on research projects (SAR, p.616).

Various ways for ongoing development of teachers' qualifications are reflected through participation in events (conferences, methodological seminars, courses), working as experts and consultants, agreements signed between the University and each of the RTU faculties. The representatives of academic staff expressed their positive opinion on the University support (providing of literature, publications publishing, participation in conferences, courses for improving soft skills), towards development of qualifications. Additionally, social partners support the procurement of equipment (meeting on 16th of February 2022).

The CVs of teachers, who are involved in study process realisation (presented in SAR), are in line with the intended learning outcomes of this study programme.

The ratio between number of teachers and students is 20 employed teachers per 46 students, or 2/3 (SAR, p.625).

2.4.2.In accordance with the data presented in the SAR (Table, p.622), the composition of the academic staff is as follows: 5 professors, 6 associate professors, 3 assistant professors, 4 lecturers, 8 lectors, 3 researchers, 1 leader researcher, 1 staff lab. Additionally, when it comes to participants with scientific degrees, the mentioned list consists of: 15 doctors of science, 17 masters. The presented figures and academic positions meet the legal requirements (Law on Higher Education Institutions, Latvia, Section 39, p.23)

The age structure is favourable: 43,75% of the teachers are between 41 and 50 years old, from 51 to 60 (18,75%).

2.4.3. N/A

2.4.4. The qualifications of the academic staff involved in this Professional Bachelor Study Programme conform to the requirements of regulatory enactments (SAR, p.615). It consists of the employees elected to the academic positions at this Institution, guest lecturers, (currently one guest lecturer is involved in study programme implementation) and Doctoral students. The characteristics of their CVs presented on p.615 (SAR), are in line with the requirements of criteria 2.4.4. Detailed information regarding involvement of teachers in scientific research, artistic creation activities and patent creativity (provided on e-platform) confirms the compliance of teachers' qualifications and requirements to the mentioned criteria (see also Study Field appendixes 2.3 and 2.4, as well as SAR p.161-165).

2.4.5.Mechanisms for promotion of cooperation in the frame of academic staff and ensuring the relation between the study programme and study courses/modules are based, first of all, on University mechanisms for development of methodological competencies (academic conferences – "Integration of Methodological and Scientific Work into the Study Process", professional training seminars).

As it can be seen (SAR, p.579), the main goal of this study programme is: "To provide bachelor's professional higher education and to prepare specialists corresponding to the requirements of the labour market in geodesy, surveying, cartography; to provide professional education in the subfield

of geomatics; in accordance with the approved professional standards, a set of ... and practical skills corresponding to the requirements of professional higher education ...). It means that the cooperation between academic environment and professionals from industry (reflects through involvement of professionals as guest lecturers, their participation in preparation of thesis, traineeship feedback) in study courses delivery - confirmed on meetings with teachers and employers on 16th of February 2022 - is very useful for strengthening the relation study programme/study courses.

In addition, meetings among teachers regarding content of study courses and achievements of intended learning outcomes, are organised at the prior to the beginning and after each semester. The results of students' surveys are a good base for discussions during these meetings (some teachers organise their own surveys). Furthermore, the students' opinion is taken into account in processes of study courses upgrading (confirmed by teachers and students - meetings on 16th of February, 2022). On the other side, Faculty Council also involves student representatives

Conclusions on this set of criteria, by indicating strengths and weaknesses

Facts and figures relate to the characteristics of teachers' professional biographies, as well as, their involvement in realisation of this study process (SAR) is in line with the national legal requirements for implementation of study programmes (Law on Higher education, p.23). Furthermore, they are a good basis for achievement of the aims (mentioned in 3.4.1.) and learning outcomes (SAR, p.579).

Number of teachers involved in delivery of this study programme, their academic positions and the age structure are part of the SAR. They show good condition and are favourable for realisation of the study programme on a high level of quality, if the institution keeps the same (or even better) balance of teaching staff composition in the future, meaning the number of teachers, their scientific degrees and age.

Various mechanisms (both on the University level and on the level of study programme) for promotion the cooperation between teachers, as well as strengthening the relation study programmeme/study courses are put in place. In this context, the participation of students and employers in the creation of the study programme through various surveys, meetings, events, should be especially emphasised. This has been confirmed by teachers, students and employers (meetings – 16th of February 2022). In accordance with the results of the analysis, it can be concluded that teachers who participate in delivery of this study programme meet the requirements of criteria 2.4.4.

Strengths:
1. Good collaboration among academic staff on one hand, students and employers on the other hand in various processes of upgrading the study programme.

Weaknesses:
1. The ratio between number of teachers and students

Assessment of the requirement [7]

1 R7 - Compliance of the qualification of the academic staff and visiting professors, visiting associate professors, visiting docents, visiting lecturers and visiting assistants with the conditions for the implementation of the study programme and the requirements set out in the respective regulatory enactments.

Assessment of compliance: Fully compliant

Law on Higher Education Institutions, section 39,p.23 Academic Staff of Vocational Study Programmes

2.5. Assessment of the Compliance

Requirements

1 1 - The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard

Assessment of compliance: Fully compliant

The study programme Geomatics (42581) complies with the Professional Higher Education Standard (Cabinet of Ministers No 512.) Study programme length is 4,5 years (180CP), consisting of 28 CP in overall educational part, 44 CP in field theoretical part, 60 CP in field professional specialisation and 26 CP in traineeship, 10 CP free elective part and 12 CP for Bachelors thesis. See annex 6.pielikums.

2 2 - The study programme complies with a valid professional standard or the requirements for the professional qualification (if there is no professional standard required for the relevant occupation) provided if the completion of the study programme leads to a professional qualification (if applicable)

Assessment of compliance: Fully compliant

Current professional standard was approved in 2008. Nevertheless, RTU has evaluated study programme compliance with the last available standard version https://registri.visc.gov.lv/profizglitiba/dokumenti/standarti/ps0430.pdf . Study programme syllabus and traineeship are organised in a manner that students can meet all requirements set in the standard. See annex: 7.pielikums_salīdzinājums ar profesijas standartiem

3 3 - 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 561 , Paragraph two and Section 562 , Paragraph two of the Law on Higher Education Institutions.

Assessment of compliance: Partially compliant

Study course descriptions are well prepared and they contain all basic knowledge on the length, syllabus, learning outcomes, and evaluation methods in the study course. Since the programme is held also in English, course descriptions are available also in English. Nevertheless, compulsory literature should be revised and updated, because most of the literature is from 2000s'. To create even better study course descriptions in the future RTU can consider adding a table which includes on what lecture, lesson what type of knowledge check will be held, and add more detailed descriptions on what will be learned in each lecture, lesson. See annex: 10.p.Lv

4 4 - The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure according to which state recognised documents of higher education are issued.

Assessment of compliance: Fully compliant

Diploma issued complies with the state legislation. See annex diploma_paraugsLV_ENG.

5 5 - 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 Higher Education Institutions.

Assessment of compliance: Not relevant

Not applicable

6 6 - 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 Higher Education Institutions.

Assessment of compliance: Not relevant

Not applicable

7 7 - 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 (if applicable).

Assessment of compliance: Not relevant

Not applicable

8 8 - 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

Academic staff has sufficient latvian language knowledge for implementing study courses, see annex : Apliecinājums - valsts valodas prasme.

9 9 - 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 (if applicable).

Assessment of compliance: Not relevant

Not applicable

10 10 - The sample of the study agreement complies with the mandatory provisions to be included in the study agreement.

Assessment of compliance: Fully compliant

Study agreements include all necessary parts set in legislation. See the annex: Studiju līgumi.

11 11 - The higher education institution / college has provided confirmation that students will be provided with opportunities to continue their education in another study programme or another higher education institution or college (agreement with another accredited higher education institution or college) if the implementation of the study programme is terminated.

Assessment of compliance: Fully compliant

The RTU has an agreement with LLU (Latvia University of Life Sciences and Technologies) that in case the study programme will be terminated students will be provided with the option to continue studies in LLU. See file VienosanÉs_LLU un RTU_Arhitektura_buvnieciba. RTU in future should provide information about exactly which study programme students can continue their studies. This information also would be beneficial for the students.

12 12 - The higher education institution / college has provided confirmation that students are guaranteed compensation for losses if the study programme is not accredited or the study programme's license is revoked due to the actions (actions or omissions) of the higher education institution or college and the student does not wish to continue studies in another study programme.

Assessment of compliance: Fully compliant

RTU confirms that they will compensate losses for students in case of termination of study programme. See annex: Apliecinājums - par zaudējumu kompensāciju.

13 13 - The joint study programmes comply with the requirements prescribed in Section 55.(1), Paragraphs one, two, and seven of the Law on Higher Education Institutions (if applicable)

Assessment of compliance: Not relevant

Not applicable

14 14 - Compliance with the requirements specified in other regulatory enactments that apply to the study programme being assessed (if applicable)

Assessment of compliance: Not relevant

Not applicable

Assessment of the requirement [8]

1 R8 - Compliance of the study programme with the requirements set forth in the Law on Higher Education Institutions and other regulatory enactments.

Assessment of compliance: Fully compliant

All regulatory requirements are met and fullfiled.

General conclusions about the study programme, indicating the most important strengths and weaknesses of the study programme

Overall the professional bachelor study programme "Geomatics" fulfils all the relevant requirements. Study programme is unique in Latvia and prepares high quality specialists in geodesy and surveying. Only insignificant shortcomings have been identified, most notably the low enrolment numbers and the fact that not all state funded places are taken up. Part time study programme cost does not correspond to the actual costs per student. Also full time employment by most students in both full and part time programmes make the qualitative distinction between the two types of programme unclear. Students indicated that more diversified teaching methods including regular field trips and exposure to the industry beyond the internship can be beneficial especially at the beginning of the studies. Furthermore, the financial viability of the part time program should be reconsidered.
The organisation and realization of the internships are regulated by a contract signed by the University, students and host.
The funding available to the study programme, funding sources and the use of funding ensures full implementation of the study process.

Strengths:
Distance learning opportunities are provided in sufficient quantities and the University provides the necessary study and technical resources to the student. Graduates are in great demand in the labor market and students start working practically in the first study courses.
The aims of the programme are in line with state education standards, the required professional

skills and motivation for lifelong learning, while the requirements of the European Qualifications Framework are followed in the processes of assuring the quality of implementation and learning outcomes accomplishment.

Evaluation of the study programme "Geomatics"

Evaluation of the study programme:

Good

2.6. Recommendations for the Study Programme "Geomatics"

Short-term recommendations

Long-term recommendations

Introducing instruments for improving the ratio students - teaching staff.
More diversified teaching methods including regular field trips and exposure to the industry beyond the internship need to be implemented
To raise awareness of the study programme and potentially raise enrolled student count consider advertising of geomatics among secondary schools, geography olympiad or in RTU school etc.
Find out reasons for high dropout rate and develop mechanisms to minimise them
Specify the rules and the difference in terms of student employment in both full and part time programmes

II - "Civil Engineering" ASSESSMENT

II - "Civil Engineering" ASSESSMENT

2.1. Indicators Describing the Study Programme

Analysis

2.1.1 The Professional Bachelor Study Programme Civil Engineering (42582), which is offered in the Latvian language, was accredited by the decision of the Accreditation Commission of LR Ministry of Education and Science of 29 May, 2017 – accreditation certificate No. 2020/39. The study programme foresees full-time studies of 4 years and 6 months or 5 years part-time. After a successful completion, the professional bachelor's study programme offers to the students the qualification of civil engineer, which corresponds to the professional standard PS-186, approved at the meeting of the Tripartite Cooperation Council for Vocational Education and Employment on 13 October 2021, Protocol No. 6.
In order to receive the degree of this study programme 180 credits are needed to be completed (see Annex 9). The study programme is in compliance with the study field and its aims are in line with the strategic objectives of RTU. The study programme has been developed according to the Law on Higher Education Institutions of the Republic of Latvia and the Classification of Education of the Republic of Latvia.

2.1.2 As stated in the SAR, the aim of the study programme is to provide education and training to civil engineers. The study programme also uses the management system that is described in

www.rtu.lv/content/view/5257/1874/lang,lv/, to assure quality of implementation and learning outcome accomplishment. As stated in the SAR, the principles of the Latvian Qualifications Framework (LQF) and the European Qualifications Framework (EQF) are closely observed during the implementation and development of the study programme.
The study programme can enrol RTU students that completed a 3-year first level professional degree in civil engineering and also enrols candidates with the secondary or compatible education.The study programme can also enrol RTU students that completed a three-year first level professional education in civil engineering. In this effect, the previously covered subjects are aligned with this study programme's subjects, thus the integration of the newly enrolled students is direct.
The aims, objectives, learning outcomes and admission requirements are interrelated. In order to achieve the aims of the programme, programme learning outcomes are defined (see planned learning outcomes in SAR). The curriculum has been designed to utilize its alumni with the ability to develop at the relevant enterprises that operate in the construction sector. According to the study programme's curriculum design, the alumni will be able to develop both as civil works managers, and as civil engineers. The title, code, degree and professional qualification of the study programme are interrelated, while the full and part-time studies are reasonable and justified.

2.1.3 As it was stated in the SAR, during the 2017 to 2021 reporting period, the following courses were removed from the study courses list: HFA101 Sports, BBK428 Testing of structural materials, IET103 Economics, BMT305 Building Chemistry, DIM203 Supplementary Mathematics (civil engineering), ĶPI103 Basics of Materials Science, BBK383 Timber and Plastic Structures, IBO491 Economics of Building Construction, BMT456 Protection of Environment in Civil Engineering and BMT463 Technological Design, etc.. The study programme has been modified with the addition of courses that provide two specialisation areas: BBR752 Technical English for Civil Engineers, HFL433 Presentation skills, BTG711 Building information modelling, SDD700 Innovative Product Development and Entrepreneurship, BTM712 Properties of construction materials and manufacturing technologies. Current industry trend-related changes have been adopted to the courses BBK728 Basics of Structural Design, BBM717 Structural Analysis, BBR745 Construction Technology. These modifications show that the study programme is updated to stay relevant to the industry's evolution and changes.
Furthermore, due to changes in the qualification structure of the branches and the legislation of the Republic of Latvia, the professional qualification obtained in the professional bachelor study programme "Civil Engineering" was adjusted from "Civil engineer" to "Building civil engineer".

2.1.4 The numbers of students have been high and steady income is noted based on Annex 5. As stated in the SAR and based on interviews with social partners, the economic and social substantiation of the study programme is based on the development trends of the civil engineering field, including fluctuations in the construction industry, as well as forecasting the production scope and costs in the next years. A relevant survey shows that during the period of 2020-2024 the experts and combined forecasts predicted a further increase of the industry's costs. For 2020-2022 this increase is estimated within a range of 1% to 5% per year, and by 2024 it could be reaching 6%. This is partly related to the Civil Engineering technology that graduates implement or are not able to implement during the project construction, technologies such as BIM. Therefore, the study programme is taking steps towards remedy this situation through the development of the new BIM programme that is now operating and training graduates on BIM related technology. Combined with the construction's industry growth, the economic and social justification of the study programme is found to be solid.
Finally, the employers find the graduates knowledgeable, with the required skills to perform the professional tasks required by the industry. According to the RTU data on the graduates, 90% of the internship students continue to work in their internship after graduation. It is also important to note

here that the enrollment of new students in 2021 was higher than that in 2020. This is an indication that the study programme is sustainable and growing even under difficult conditions such as the period of the pandemic.

2.1.5 N/A

Conclusions on this set of criteria, by specifying strengths and weaknesses

The study programme foresees full-time studies of 4 years and 6 months or 5 years part-time, where after a successful completion, it offers the qualification of civil engineer, which corresponds to the professional standard PS-186. To complete the programme the students need to acquire 180 CP. The aims, objectives, learning outcomes and admission requirements are interrelated. The Expert Group found that the programme's content is modified and this shows that it is updated to stay relevant to the industry's evolution and changes.

Strengths:
1. A popular study programme that attracts a large number of students.

Weaknesses:
N/A

2.2. The Content of Studies and Implementation Thereof

Analysis

2.2.1 The objective of the professional bachelor study programme Civil Engineering (42582) is to prepare second level professional civil engineers specialising in the field of construction (SAR, p.233). The programme aims are set out clearly in eight statements setting out the expectations of graduate attributes. The attributes are primarily professional skills and the creation of a culture of teamwork supported by strong independent skills (SAR p. 233 and 237). Compliance with state education standards is assured (SAR, Annex 6), as is compliance with professional standards (approved at the meeting of the Tripartite Cooperation Council for Vocational Education and Employment on 13 October 2021, Minutes No. 6).
The modules comprise general education, specialist topics, humanities, Technical English for Civil Engineers, practical internships and Presentation Skills. Modules are mapped to programme outcomes to ensure that all requirements are met in respect of knowledge, skills and competence (SAR, Annex 8 and p.241). This demonstrates the interconnected and complementary nature of the modules. The academic staff meet annually, under the guidance of the Head of Department, to ensure that any updating of the courses does not lead to duplication. The modules are well integrated and aligned with the programme outcomes through a planning map (SAR, Annex 9 and p.241). The Expert Group learned in meetings with students that they found the first year of the programme to be uninspiring due to the dominance of basic sciences over engineering topics and the absence of sufficient field trips related to inspiring engineering works.
The learning outcomes for each module are set out in a comprehensive descriptor template (SAR, Annex 10). The descriptors are accessible to all relevant stakeholders through the ORTUS platform. The learning outcomes are adequate but the phraseology (especially the dominant verb in a sentence) could be improved to the benefit of students, those delivering the programmes and all those responsible for challenging the students to achieve their full potential at each stage of the programme. Specifically there is a need to explicitly set out the incremental rise in expectations of learning and assessment criteria at each stage. Sentences beginning with phrases such as "The ability to ...." could usefully be replaced by phrases beginning with "define", "infer", "calculate",

“analyse”, “evaluate”, “design” etc., to reflect the increasing level of expectation from the learners as they progress through the programme.
The programme aims, suite of modules and content meet the needs of industry and comply with the requirements for second professional level of ‘building civil engineer’ (PS-186). This ensures the topicality of the content. There is a very strong need for the programme’s graduates in the market. Currently the demand exceeds the supply. The Expert Group learned during the site visit that many students continue in the employment of their host internship company while trying to complete their studies.

2.2.2 Not applicable to this professional bachelor study programme.

2.2.3 The study implementation method is student-centred. Lectures are combined with practical classes, field trips and visits to enterprises. Students may request individual tutorials. Provision is made for students to self-assess and to engage in group study (SAR, p.245). Summative assessment is used with examination papers accounting for a maximum of 50% of the final grade (SAR, p.244). The Expert Group determined through meetings with students of Civil Engineering programmes that RTU respond in a timely manner to feedback on instances where student-centred learning and teaching principles are not reflected in the lecturer’s performance.

2.2.4 Internships are carefully organised on a student-centred case-by-case basis. The organisation of the internships is highly effective with prior consultation on the specific expertise of the host company to deliver achievable learning outcomes in one of a number of streams. The Expert Group learned in meetings with stakeholders that internship is arranged in respect of one of the streams. A tripartite contract (RTU-student-host) is signed off to comply with the requirements of regulatory enactments. There is careful alignment of the learning outcomes of each internship with the learning outcomes of selected modules on a student-centred case-by-case basis (SAR, p.235). Joint supervision is conducted by nominated supervisors in both the university and the host organisation. The level of real-time engagement by the university supervisor during the internship was reported by the students to be very low, if at all, but the Expert Group found that this was not a matter of concern to the students.

2.2.5 Not applicable to this professional bachelor study programme.

2.2.6 The final theses test the students technical competence. Employer representatives are members of the graduate paper examination committee (SAR, p.243). The Expert Group inspected a sample of theses and found that the final works were strong on a test of knowledge but are weak on providing students with an opportunity to demonstrate their ability to synthesise competing agendas in a multidisciplinary project and demonstrate informed judgement. There was a great emphasis in the final theses on the calculations of structural elements but little evidence of challenging the student to use higher order skills of design in respect of creative solutions to integrating interdisciplinary issues of building architecture, fire safety, energy efficiency, internal engineering networks, acoustics, economics (estimates) and work organisation.

Conclusions on this set of criteria, by specifying strengths and weaknesses

The programme aims are set out clearly in eight statements setting out the expectations of gaining professional skills and a culture of teamwork supported by strong independent skills. Compliance with state education and professional standards is assured. Modules are mapped to programme outcomes to ensure that all requirements are met in respect of knowledge, skills and competence. Annual review of module content is co-ordinated under the guidance of the Head of Department. The

modules are well integrated and aligned with the programme outcomes through a planning map.
The Expert Group learned in meetings with students that they found the first year of the programme to be uninspiring due to the dominance of basic sciences over engineering topics and the absence of sufficient field trips related to inspiring engineering works.
The learning outcomes for each module are comprehensive and are accessible through a standard template on the ORTUS platform. The learning outcomes are adequate but the phraseology (especially the dominant verb in a sentence) could be improved to challenge the students to achieve their full potential at each stage of the programme and to recognize the incremental rise in expectations of learning and assessment criteria at each stage.
The programme aims, suite of modules and content meet the needs of industry and comply with the requirements for second professional level of 'building civil engineer' (PS-186). Currently the demand in the market exceeds the supply of graduates. The Expert Group learned during the site visit that many students continue in the employment of their host internship company while trying to complete their studies.
The study implementation method is student-centred. Students may request individual tutorials. Provision is made for students to self-assess and to engage in group study. Summative assessment is used. RTU responds in a timely manner to student feedback on shortcomings in the programme's delivery.
The organisation of the internships is highly effective. There is careful alignment of the learning outcomes of each internship with the learning outcomes of a particular set of specialist modules on a student-centred case-by-case basis. Joint supervision is conducted by RTU and the host organisation. The level of real-time engagement by the university supervisor during the internship was reported by the students to be very low, if at all, but no concerns were expressed by the students.
The final theses includes a major design project. Employer representatives are members of the graduate paper examination committee. The final works were strong on a test of knowledge but weak on providing students with an opportunity to demonstrate their ability to synthesise competing agendas in a multidisciplinary project and demonstrate informed judgement. Final works do not include a comprehensive set of required knowledge, in accordance with the qualification requirements for a Civil (building) engineer - see essential requirements of structures (specified in Regulation (EC) No. 305/2011 of the European Parliament and of the Council and Section 9 of the Latvian Construction Law).

Strengths:
1. Careful alignment of the learning outcomes of each internship with the learning outcomes of selected modules on a student-centred case-by-case basis.
2. Annual reviews of the study content ensure continuous relevance to the field.

Weaknesses:
1. The phraseology of learning outcomes does not reflect the incremental higher order of challenge to the students as they progress up through the stages of the programme.
2. Students' motivation is negatively impacted by the lack of a deeper exposure to engineering applications of the basic sciences and greater connection with engineering field trips in the first year of the programme.
3. The final works over-emphasise a test of technical competence in design of elements rather than the students' ability to creatively design solutions with competing design constraints of architectural issues, fire safety, energy efficiency building service networks and cost.

Assessment of the requirement [5] (applicable only to master's or doctoral study programmes)

1 R5 - The study programme for obtaining a master's or doctoral degree is based on the achievements and findings of the respective field of science or field of artistic creation.

Assessment of compliance: Not relevant

Not applicable to this bachelors degree programme.

2.3. Resources and Provision of the Study Programme

Analysis

2.3.1. The study program Civil Engineering (42582) provides the qualification “Civil Engineer”.
RTU funding from the basic state budget is made up of the study base financing corresponding to the list of study programmes and the number of students; it is used to cover such expenses as utilities, taxes, infrastructure maintenance (including data for the Student and Graduate Register), purchase of equipment and supplies, staff remuneration, and funding for research activities.
The library, material and technical provision and financial provision correspond to specific features and conditions for the implementation of the study programme, create preconditions for achieving study results and indicate the possibility to ensure a quality study process.
Students learn modern teaching methods using such modern modelling and structural calculations computer programs as Autodesk AutoCAD, Axis, Robot, RFEM, Revit and others.
The ORTUS platform has well-organized teaching materials, literature, curriculum and correspondence with teachers and trainers. Learning outcomes are good.
The measuring instruments purchased by the university and used in the training process are not fully calibrated. Their readings are not completely verifiable. During the test procedure, some measuring equipment is not working or is not ready for operation.
After completion of the construction, the RTU Ķīpsala campus is becoming modern engineering study centre in the Baltic States.
The issue of sustainable development is taken into account in the construction process of the campus.

2.3.2. N/A

2.3.3. RTU funding from the state basic budget for the provision of study seats in the respective academic year is distributed in accordance with the decision of RTU Senate “Methodology for the distribution and use of funding for the structural units of RTU in academic year 2020/2021”. The methodology (Appendix 16 of the list of Internal regulations) is reviewed and revised every year and is subjected to any necessary changes.
RTU has a decentralized budget, and each organizational unit is allocated a separate budget. In a general sense, a budget is a plan of revenues and expenditures for a specific period of time, work, event or function. The revenues and expenditures of RTU shall be administered in accordance with principles approved by the Senate or as stipulated by the vice-Rector for Finance.
According to the Budget Allocation Methodology, the financing is allocated to the organizational units either according to the financial or budget year or immediately after receiving the financing. The financial or budget year of RTU organizational units is from October to September of the following year.
The study programme has the minimum number of students to ensure the profitability of the study programme.
The financial provision corresponds to the specifics and conditions of the study program implementation, creates preconditions for achieving the study results and indicates the possibility to ensure a quality study process.
Minimum number of students to ensure profitability of the study programme:

For full-time intramural local students: 19 students.
For part-time intramural and part-time extramural local students: 15 students.
For full-time intramural foreign students: 12-20 students depending on the country of origin (i.e., paid tuition fees (European Union, Commonwealth of Independent States, other)).
In order to ensure the effectiveness of study programme, similar study courses are implemented jointly for students of several study programmes (for example, mathematics, general sociology, etc.).

Conclusions on this set of criteria, by specifying strengths and weaknesses

Overall resources and provision of the study programme are compliant for the study programme.

Strengths:
1. The ORTUS platform is well-organized.
2. The technical provision of study materials, instruments, measuring equipment is sufficient and corresponds to the study plan and content.

Weaknesses:
1. The measuring instruments are not fully calibrated and during the test procedure some measuring equipment is not ready for operation.

Assessment of the requirement [6]

1 R6 - Compliance of the study provision, science provision (if applicable), informative provision (including library), material and technical provision and financial provision with the conditions for the implementation of the study programme and ensuring the achievement of learning outcomes

Assessment of compliance: Fully compliant

The study programme has all the necessary provisions for the implementation of the learning outcomes

2.4. Teaching Staff

Analysis

2.4.1. In accordance with SAR, p.261, the composition of teaching staff at this study programme Civil Engineering (42582) is as follows: 16 professors – Doctors of Science, 7 elected associate professors – Doctors of Science, 11 assistant professors, 7 lecturers, 3 leading researchers, 1 researcher, 1 assistant.
Number and structure of the teaching staff per department is:
Department of Building Structures – 11 academic staff members, including 3 professors, 2 associate professors, 5 assistant professors and 1 lecturer.
Department of Construction Mechanics - 4 academic staff members, including 1 associate professor, 1 senior researcher, 1 assistant professor and 1 lecturer.
Department of Computer Aided Engineering Graphics - 4 teaching staff members, (1 academic, 1 assistant professor,1 practical assistant professor and 1 lecturer.
Department of Civil Engineering -11 academic staff members, (1 associate professor, 4 assistant professors, 3 lecturers, 1 assistant, 2 research assistants).
Department of Construction Production – 8 academic staff members, including 2 professors, 2 associate professors, 2 assistant professors, 1 senior researcher, 1 researcher.
Department of Composite Materials and Structures – 4 academic staff members, (2 professors, 1

assistant professor, 1 lecturer.

Department of Building Materials and Building Products – 11 academic staff members, (2 professors, 1 associate professor, 4 assistant professors, 1 senior researcher, 1 researcher.
This distribution of the teachers caused the reaction of the expert team, reflected in the question (Meeting with academic staff – 15th of February 2022) related to the composition per department. Namely, the professors were asked to express their opinion about the opportunities for delivering the knowledge to students at a satisfactory level, in the frame of departments with a lower number of teachers. The teachers explained that most of them are involved in the study process in various departments.

Furthermore, the analysis of CVs of teachers involved in the implementation of the study programme leads to the conclusion that their qualifications are good base for achievement of the aims,. (". . . to ensure 2nd level professional higher education in the branch of construction, in order to prepare engineers for independent work as well as to ensure professional bachelor`s degree that gives a possibility to continue studies in professional /academic undergraduate study programmes'') and learning outcomes of the study programme, (''knowledge of facts, theories and patterns necessary for personal growth and development, civic participation, social integration and continuing education; . . . to understand in detail and demonstrate knowledge of a wide variety of specific facts, principles, processes and concepts in a given field of study or professional activity in standard and non-standard situations; are familiar with technologies and methods for carrying out learning tasks or work assignments . . .) - SAR, p.233.

Namely, there are members of the teaching staff who carry out the scientific activities, (preparation of scientific publications, participation in international scientific events, members of the editorial boards of international scientific journals, supervisors of theses, members of Latvian Science bodies, leading the research projects). On the other hand, teachers are also active in professional and practical activities directed towards aims and intended learning outcomes. For example, organising of interactive Engineering Graphics course,(freely accessible to all civil engineering students), in the frame of the project Virstem – Virtual Technology; organising of event, "Digital Construction Education Day", with basic aim to explore the current situation at higher education institutions in the country and to promote digitisation in the field of construction.

2.4.2. The overall changes in the number of teachers on various academic positions, (which are not so significant, except for lecturers), in the period from 2016/2017 academic year, since 2020/2021 academic year, is presented in Table, (p.261). Measures which are undertaken for providing the quality in delivering of study courses, despite these changes, are the same as it was mentioned in the part of this Joint Opinion related to the study programme - code 41582. Furthermore, the teachers' opinion, (Meeting with academic staff – 15th of February 2022), regarding the University support in their professional development is also positive.
The student – faculty ratio in time of the submission of the SAR, is 685/46, or one member of the academic staff to 15 students.

2.4.3. N/A

2.4.4. As it can be seen from the SAR (p.254): "Qualifications and achievements of the academic staff are described by departments, but not all members of academic staff of a department appear in the study programme outline. The outline is based on the load of academic year 2020/21, but the work during the reporting period andimplementation of the study courses is not possible without all department staff involved, as they participate in facilitating the study processes, research activities,

and graduate paper supervision". Therefore, the analysis related to the fulfilment of this criterion, given for the previous study program, indicates the same results. Namely, the data presented in SAR (p.255) and in annexes prepared by the University (mostly of them are on e-platform) indicate the facts that teachers' CVs who participated in this study programme are in line with the requirements of this criteria (publishing of papers in peer-reviewed editions, including international editions) and the teachers have artistic achievements or five years of practical experiences (see also Study Field appendixes 2.3 and 2.4, as well as SAR p.253-260).

2.4.5. The same mechanisms for promoting the cooperation and ensuring the interrelation between this study programme, (code 42582), and study courses are applied, as it was in case of study programme, (code 41582).

Conclusions on this set of criteria, by indicating strengths and weaknesses

Number of teachers who are involved in the realisation of the study process per department varies considerably. (For instance, the Department of Building Structures unites 11 academic staff members, whereas at the Department of Construction Mechanics there are only 4 academic staff members involved in the implementation of study courses). The teachers clarified that they are engaged in the study process in several departments.
Members of academic staff are active in preparation of scientific publications, learning aids, training courses. They participate in national and international projects, mobility programs, professional associations and professional bodies, different events, (conferencies, seminars, exhibitions).
The analysis of SAR indicates that the management takes into account the sustainability of this study programme, especially when it comes to the number and composition of teachers.
Therefore, it can be concluded that the composition of the teaching staff involved in this study programme, (when it comes to academic and scientific qualifications, academic positions, as well as, professional skills and competencies), is a good base for high level of quality in study programme delivery. Members of teaching staff involved in realization of this study programme meet the requirements of criteria 2.4.4. (Joint Opinion).

Strengths:
1. It is evident that a careful think-through over last years took part in planning the composition of the teaching staff.

Weaknesses:
1. There are no significant weaknesses for teaching staff of this study programme.

Assessment of the requirement [7]

1 R7 - Compliance of the qualification of the academic staff and visiting professors, visiting associate professors, visiting docents, visiting lecturers and visiting assistants with the conditions for the implementation of the study programme and the requirements set out in the respective regulatory enactments.

Assessment of compliance: Fully compliant

Law on Higher Education Institutions, Section 39,
Academic Staff of Vocational Study Programmes

2.5. Assessment of the Compliance

Requirements

1 1 - The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard

Assessment of compliance: Fully compliant

Study programme Civil Engineering (42582) complies with Professional Higher Education Standard (Cabinet of Ministers No. 512) Study programme total volume 180 CP of which at least 116 CP are compulsory part covering overall educational, field theoretical, field practical study courses, at least 18 CP for limited choice study courses part, at least 6 CP are free choice study courses, Traineeship at least 20 CP and at least 20 CP for final, state examinations, which include a Bachelor Thesis with Engineering Design Project. Compliance with the study programme with the State Education Standard Annex No 6

2 2 - The study programme complies with a valid professional standard or the requirements for the professional qualification (if there is no professional standard required for the relevant occupation) provided if the completion of the study programme leads to a professional qualification (if applicable)

Assessment of compliance: Fully compliant

Meets the criteria and professional requirements “Regulations of the Cabinet of Ministers on the Classifier of Professions, Basic Tasks Corresponding to the Profession and Basic Qualification Requirements No. 264 (May 23, 2017)” and “Standard for the profession of Civil Engineer” (October 13, 2021)

3 3 - 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 561 , Paragraph two and Section 562 , Paragraph two of the Law on Higher Education Institutions.

Assessment of compliance: Partially compliant

Study course descriptions are well prepared and they contain all basic knowledge on the length, syllabus, learning outcomes, and evaluation methods in the study course. Nevertheless, compulsory literature should be revised and updated, because some of the literature is from 1970-2000s'. To create even better study course descriptions in the future RTU can consider adding a table which includes on what lecture, lesson what type of knowledge check will be held, and add more detailed descriptions on what will be learned in each lecture, lesson. Some descriptions contain the title of databases in Latvian See annex: RBCB0_EN.

4 4 - The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure according to which state recognised documents of higher education are issued.

Assessment of compliance: Fully compliant

Diploma issued complies with the state legislation. See annex of the study programme: Sample of the diploma

5 5 - 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 Higher Education Institutions.

Assessment of compliance: Not relevant

6 6 - 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 Higher Education Institutions.

Assessment of compliance: Not relevant

7 7 - 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 (if applicable).

Assessment of compliance: Not relevant

8 8 - 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

Academic staff has sufficient latvian language knowledge for implementing study courses, see annex : Apliecinājums - valsts valodas prasme.

9 9 - 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 (if applicable).

Assessment of compliance: Not relevant

10 10 - The sample of the study agreement complies with the mandatory provisions to be included in the study agreement.

Assessment of compliance: Fully compliant

Study agreements include all necessary parts set in legislation. See the annex: Studiju līgumi.

11 11 - The higher education institution / college has provided confirmation that students will be provided with opportunities to continue their education in another study programme or another higher education institution or college (agreement with another accredited higher education institution or college) if the implementation of the study programme is terminated.

Assessment of compliance: Fully compliant

The RTU has an agreement with LLU (Latvia University of Life Sciences and Technologies) that in case the study programme will be terminated students will be provided with option to continue studies in LLU. See file Agreement LLU and RTU. RTU in future should provide information about exactly which study programme students can continue their studies. This information also would be beneficial for the students.

12 12 - The higher education institution / college has provided confirmation that students are guaranteed compensation for losses if the study programme is not accredited or the study programme’s license is revoked due to the actions (actions or omissions) of the higher education institution or college and the student does not wish to continue studies in another study programme.

Assessment of compliance: Fully compliant

RTU confirms that they will compensate losses for students in case of termination of study programme. See annex: Confirmation on compensation for losses

13 13 - The joint study programmes comply with the requirements prescribed in Section 55.(1), Paragraphs one, two, and seven of the Law on Higher Education Institutions (if applicable)

Assessment of compliance: Not relevant

14 14 - Compliance with the requirements specified in other regulatory enactments that apply to the study programme being assessed (if applicable)

Assessment of compliance: Fully compliant

RTU has indicated that this study programme complies with Civil Engineering law (Pursuant to Article 13 of the Civil Engineering Law). See annex: Compliance of the study programme with the specific regulatory framework of the relevant sector.

Assessment of the requirement [8]

1 R8 - Compliance of the study programme with the requirements set forth in the Law on Higher Education Institutions and other regulatory enactments.

Assessment of compliance: Fully compliant

All regulatory requirements are met and fulfilled.

General conclusions about the study programme, indicating the most important strengths and weaknesses of the study programme

The Professional bachelor study programme “Civil Engineering” is organised as fulltime studies of 4 years and 6 months or 5 years part time extramural studies, in Latvian language. The qualification of civil engineer is offered.

The basic aim of this programme is to provide 2nd level professional higher education in the branch of construction. It is in line with the study field “Architecture and Construction”. The study programme complies with Professional Higher Education Standard (Cabinet of Ministers No.141).

This study programme enables enrolment of RTU students who completed a 3-year first level professional education in civil engineering, students who finished a 3-year first level professional degree in civil engineering, as well as candidates with the secondary or compatible education. The curriculum is adapted to the needs of alumni (they are able to develop both as civil works managers and as civil engineers).

This study programme is updated according to the requirements of the industry. Furthermore, according to the national legislation and changes in the qualification structure of the branches, the professional qualification was adjusted to “Civil Engineer.”
This study programme is very popular, the number of enrolled students is increasing and graduates obtain the required skills.

The aims of the programme comply with national education and professional standards, modules are mapped to programme outcomes and their annual reviewing is carried out under the guidance of the Head of the Department.

The learning outcomes are publicly available on ORTUS platform. The expert group found that there is a need for improving their phraseology.
There is an effective organisation of internships conducted by RTU and the host organisation.
The study resources correspond to specific features and conditions for the study programme implementation and during the study process students use modern modelling and structural

calculations computer programs.

University funding from the state basic budget is distributed on the base of the “Methodology for the distribution and use of funding for the structural units of RTU in academic year 2020/2021”.

Teachers involved in the study programme delivery participate in national and international projects, mobility programmes, professional associations, and professional bodies. They are also authors or co-authors of scientific and professional articles. Moreover, the management team takes care of study programme sustainability regarding number and composition of teaching staff.

The results of the study programme assessment, proves the popularity of the programme that attracts a large number of students. The learning outcomes of each internship are defined in line with those of selected modules on a student-centred case-by-case basis. ORTUS platform is very useful tool for organising the delivery of study courses, and the instruments and measuring equipment are sufficient for successful realization of students’ professional tasks. Moreover, the teaching staff composition is planned very carefully.

The observed weaknesses are directed towards: learning outcomes phraseology, since it does not reflect the incremental higher order of challenge to the students as they progress up through the programme stages. The noticed lack of a deeper exposure to engineering applications of the basic sciences, as well as, greater connection with engineering field trips in the first year of study are factors with negative impact on students’ motivation. The final works are characterised with: over-emphasised test of technical competencies in design of elements, comparing with students’ abilities to creatively design solutions, as well as, insufficient content and fulfilment of the requirements of structures (EU and Latvian legal acts). In addition, there is a need for regular maintenance of the measuring instruments which are used in training processes.

Evaluation of the study programme "Civil Engineering"

Evaluation of the study programme:

Good

2.6. Recommendations for the Study Programme "Civil Engineering"

Short-term recommendations

The final works project brief should be revised to include a greater opportunity for the student to demonstrate higher order learning appropriate to the level of the programme.

Long-term recommendations

Compulsory literature needs to be reviewed and updated (especially for obsolete publications from 1970-2000). We recommend not to include obsolete literature sources (older than 20 years) in the subject descriptions. Valid but older literature sources could be included in the list of additional literature sources as needed.

More examples of civil engineering applications of the basic sciences should be included in the first year of the programme to better motivate the students.
Building on the improvements to date in relation to making the learning outcomes more specific, they should be further refined with phraseology that better reflects the level of the programme and the incremental higher order of learning expected of students as they progress up through the stages of the programme.

II - "Heat, Gas and Water Techology" ASSESSMENT

II - "Heat, Gas and Water Techology" ASSESSMENT

2.1. Indicators Describing the Study Programme

Analysis

2.1.1. The study programme Heat, Gas and Water Techology (42582) is regulated and complies with the Law on Higher Education Institutions of the Republic of Latvia and the Classification of Education of the Republic of Latvia. See annex: Annex 6.

2.1.2. The professional bachelor study programme “Heat, Gas and Water Technology” (42582) is a full-time study programme with a total length of 5 years and part-time study programme with a total length of 6 years. Both programmes are implemented only in Latvian language. This study programme fits in and complies with study field of Architecture and Construction, with emphasis in engineering. The total number of CP in the study programme is 200 CP, which equals to 300 ECTS and complies with the State Standard for Education. Admission requirements are General or Vocational Secondary Education for full-time studies and general secondary education or 4-year vocational secondary education for part-time studies. The awarded degree is the Professional Bachelor Degree in Heat, Gas and Water Technology and the qualification to be obtained is Building engineering systems engineer in case of 5 years studies and part-time extramural studies
According to the SAR, the aim of the study programme is to educate and train highly qualified professionals in the field of heat, gas and water technology, that have high competitiveness in the labour market of Latvia and abroad. The study programme aims to provide basic theoretical knowledge and professional skills needed to allow graduates to perform development planning engineer's work or continue studies at the Master level study programmes. Its objectives are oriented on providing practical works for students, to provide comprehensive knowledge in the field of heat, gas and water technology. After finishing with their studies, students should be able to master theories, consistent patterns and technologies related to heat, gas and water technology. Several courses are interrelated and the learning outcomes of one course refer to the tasks of the following course.

2.1.3. Due to insufficient student demand, part-time intramular study of the Professional bachelor study programme “Heat, Gas and Water Technology” is no longer planned.

2.1.4. A significant decrease took place in the 2019/2020 academic year, when 26 students were expelled due to various reasons, which was 4 times higher compared to the 2016/2017 academic year. In April 2021, the total number of students at the programme “Heat, Gas and Water Technology” was 81, which was by ~ 17% less than in 2017 (98 students). The main drop-out reasons were the weak knowledge performance obtained in Secondary education, social causes/family conditions and the epidemiological situation that affected the study process of the last semester. The Faculty provides active work with school pupils approaching modern style and

covering work-life balance. However, there is uncertainty with the development rate and direction of the construction industry. In the last two academic years (2019/2020 and 2020/2021), there were no tuition fee paying students, where the total number of students who study in state budget places for the 2020/2021 academic year was 281 (see Annex 5 Students statistical data). According to SAR, graduates are mainly employed in private companies, municipal development departments and construction boards, design companies, public administrations and other sector-related organisations.

2.1.5. N/A

Conclusions on this set of criteria, by specifying strengths and weaknesses

The Experts Group found the study programme Heat, Gas and Water Techology (42582) to comply with the State Standard for Second – Level Professional Higher Education. The study programme name, degree, qualification awarded are also interrelated. The programme, aims, objectives, learning outcomes and admission requirements compliment each other and comply within the study field. Graduates of this programme are mainly employed in private companies. Due to several reasons, the number of students is decreasing despite a comparatively large number of places that are funded by the state budget.

Strengths:
1. The higher education institution provides highly qualified professionals in the field of heat, gas and water technology, that have high competitiveness in the labour market of Latvia and abroad.

Weaknesses:
1. Due to several reasons, the number of students is decreasing.

2.2. The Content of Studies and Implementation Thereof

Analysis

2.2.1. The objective of the professional bachelor study programme Heat, Gas and Water Techology (42582) is to prepare engineering students specialising in the field of building system networks to gain the qualification ‘Building engineering systems Engineer’ (SAR, p.297). The programme aims are set out clearly in ten statements setting out the expectations of graduate attributes (pp.301). The modules are well integrated and aligned with the programme outcomes through a planning map (SAR, Annex 9 and p.300).
The learning outcomes for each module are set out in a comprehensive descriptor template (SAR, Annex 10). The descriptors are accessible to all relevant stakeholders through the ORTUS platform. The learning outcomes set out the knowledge, skills and competences to be achieved. The phraseology (especially the dominant verb in a sentence) could be improved to the benefit of students, those delivering the programmes and all those responsible for challenging the students to achieve their full potential.
The curriculum content is regularly updated through the research of the academic staff and industry trends reported through the Federation of European Heating, Ventilation and Air Conditioning Associations (SAR, p.299).

2.2.2 . Not applicable to this professional bachelor study programme.

2.2.3. The programme is offered in Riga. The Expert Panel understand that information in the SAR (p.299 and p.401) is no longer valid regarding the use of distance learning for the branch campuses

of Daugavpils and Liepaja, together with students in Daugavpils and Liepaja attending Riga for their laboratory work and students in senior years attending Daugavpils Study and Science Centre.
The implementation method is student-centred, including making increased use of e-learning technologies to support individual learning styles. There is a strong emphasis on practical classes, which have recently been extended (SAR, p.298). Some modules are taught in English (SAR, p.299). Summative assessment is used (SAR, p.308).
Recognising the importance of interdisciplinary group work as a valuable learning experience for students in this study field, it would be helpful if there was a course specially for the Study Field, similar to the 'Vertically Integrated Project' as a way of getting students of architecture, civil engineering and heat, gas and water technology to work together.
The internal quality assurance system operates effectively and includes student input. Student are surveyed through module questionnaires and the annual review at faculty level includes student representatives. The academic staff are supported in developing student-centred practices through continuing professional development courses on pedagogical developments (SAR, p.309).

2.2.4. The learning outcomes for internships have recently been updated to enhance integration with other learning outcomes of the programme (SAR, p.298). Nevertheless a statement in the SAR (p.311) that "Professional internship contributes to all learning outcomes" indicates a lack of focus on the specific learning outcomes to be assessed. Internships are organised on a student-centred case-by-case basis. A tripartite contract (RTU-student-host) is signed off to comply with the requirements of regulatory enactments. Joint supervision is conducted by nominated supervisors in both the university and the host organisation. The internship is assessed based on the student's log, host company assessor's report, student's report and a presentation by the student (SAR, p.310).

2.2.5. Not applicable to this professional bachelor study programme.

2.2.6. The final thesis includes a research paper and a building services network design project at the scale of a building or a city (SAR, p.311). The research paper is based on a topical issue in the field such as ammonia nitrogen removal in wastewater treatment plants; urban rainwater drainage; use of centrifugal pumps in domestic dwellings; hydraulic balancing in heating systems (SAR p.312). Students demonstrate in the design project the ability to design systems using aerodynamic, thermal or hydraulic calculations and present a construction process. Following approval by an internal review, solutions are presented in public before an Examination Committee. The quality of the final works has been judged to be of a very high standard. In the reported period (2017-2020) 86 students averaged a score of 7.5 out of 10. Half of the final grade is assessed by the State Final Examination Committee which includes employer representatives.

Conclusions on this set of criteria, by specifying strengths and weaknesses

The objective of the professional bachelor study programme is to prepare engineering students specialising in the field of building system networks to gain the qualification 'Building engineering systems Engineer'. The programme aims are set out clearly in ten statements and the modules are well integrated and aligned with the programme outcomes.
The learning outcomes for each module are set out in a comprehensive descriptor template, accessible to all relevant stakeholders through the ORTUS platform. Although the learning outcomes set out the knowledge, skills and competences to be achieved, the phraseology could be improved to reflect the higher order of learning expected of the students as they progress through the stages of the programme.
The curriculum content is regularly updated through the research of the academic staff and reports on industry trends.

The implementation method is student-centred, including increasing use of e-learning technologies. There is an increasing emphasis on practical classes. Some modules are taught in English. Summative assessment is used. The internal quality assurance system operates effectively and includes student input. The academic staff are supported through continuing professional development courses on pedagogical developments.
The learning outcomes for internships have recently been updated. Nevertheless, a statement in the SAR that “Professional internship contributes to all learning outcomes” indicates a lack of focus on the specific learning outcomes to be assessed. Internships are organised on a student-centred case-by-case basis. A tripartite contract (RTU-student-host) is signed off to comply with the requirements of regulatory enactments. Joint supervision is conducted by nominated supervisors in both the university and the host organisation.
The final thesis includes a research paper and a building services network design project. The research paper is based on a topical issue. Students demonstrate in the design project the ability to design systems from the domestic to the urban scale. The quality of the final works has been judged to be of a very high standard. In the reported period (2017-2020) 86 students averaged a score of 7.5 out of 10. Half of the final grade is assessed by the State Final Examination Committee which includes employer representatives.

Strengths:
1. The academic staff are supported in developing student-centred practices through continuing professional development courses on pedagogical developments.

Weaknesses:
1. The phraseology of learning outcomes does not reflect the incremental higher order of challenge to the students as they progress up through the stages of the programme.
2. The learning outcomes of the internship lack specific focus to the aspects of learning that are unique to the internship period, as opposed to its contribution to the students learning of other module learning outcomes.

Assessment of the requirement [5] (applicable only to master's or doctoral study programmes)

1 R5 - The study programme for obtaining a master's or doctoral degree is based on the achievements and findings of the respective field of science or field of artistic creation.

Assessment of compliance: Not relevant

Not applicable to this bachelors degree programme.

2.3. Resources and Provision of the Study Programme

Analysis

2.3.1. The study provision, both informative and material, technical, are compliant for the study programme Heat, Gas and Water Techology (42582). Informative resources are available from RTU Scientific Library, online databases, e-books, e-journals. (SAR p. 314-316). There is a procedure developed for convenient ordering of the resources from the library and a procedure for each student to request a limited amount of new materials of special interest (according to info from site visit meetings with academic staff and students). In addition RTU ORTUS e-platform is a significant tool for student and teaching staff communication. ORTUS provides access for each student to all the data of the courses taken during the studies, and gives understanding of the course structure. Both students and teaching staff highly evaluate ORTUS. There are extensive refurbishment works

going on in the premises. Numerous new laboratories will be opened, which will promote development of the practical component of the study courses and introduction of technologies in the study process. Laboratory equipment is continuously updated with new additions (SAR p. 313 and info from site visit meetings with teaching staff).

2.3.2. N/A.

2.3.3. The funding available to the study programme, funding sources and the use of funding ensures full implementation of the study process. However there is always space for improvement. For example, as mentioned in the site visit meetings with the students, they highly value the importance of field studies, field trips, especially in the first year to get more understanding of the future profession and real life challenges. Students and graduates also mentioned the importance of cooperation with other professionals and students (architects, civil engineers), which could be more introduced in the studies. Above mentioned requires resources specially allocated as well. The funding and the cost per student has been increasing in the period of the study year 2017/2018 to 2020/2021, and the proportion of state funding has increased as well (SAR p. 317). According to the annex to SAR Funding distribution between the cost items the major part (46%) is used for remuneration, leaving for example the position of purchase and modernization of equipment with 1% and business trip expenses less than 1%. It leaves a question - is such distribution sustainable in the long term as such a great part is allocated for first necessities? The study programme has the minimum number of students to ensure the profitability of the study programme. According to the annex to SAR On minimal number of students in study programmes there must be at least 19 students in first level, bachelor's level (including second level professional study programmes) – which is met (each year there are at least 55 students enrolled in study programme).

Conclusions on this set of criteria, by specifying strengths and weaknesses

Overall resources and provision of the study programme are compliant for the study programme. There is a decent provision of informative resources. Access to it is ensured convenient. Good material and technical provision, which will be significantly improved after ongoing extensive refurbishment works in the premises and opening of new laboratories. At the same time, it is evident that the study programme would benefit from higher funding or distribution of funding providing a greater percentage for positions to provide more field trips for students and cooperation with other professionals and students (architects, civil engineers).

Strengths:
1. Provision of informative materials, availability of library resources.
2. Well functioning RTU e-platform ORTUS.
3. Well equipped workshop rooms.

Weaknesses:
1. The funding available to the study programme, the distribution of it.

Assessment of the requirement [6]

1 R6 - Compliance of the study provision, science provision (if applicable), informative provision (including library), material and technical provision and financial provision with the conditions for the implementation of the study programme and ensuring the achievement of learning outcomes

Assessment of compliance: Fully compliant

SAR p. 313-317. The study programme has all the necessary provisions for the implementation of the learning outcomes.

2.4. Teaching Staff

Analysis

2.4.1. The teaching staff associated with the programme Heat, Gas and Water Techology (42582) are highly qualified in the specialisation. The ten professors and nine associate professors assigned to the programme results in 40% of the professorial staff being members of the Latvian Academy of Sciences. Membership of the Institute of Heat, Gas and Water Technology is held by five professors, six associate professors, thirteen assistant professors and a lecturer of the programme (SAR, p.318).

2.4.2. A number of factors have contributed to the enhancement of the academic standing of staff assigned to the programme in the reported period. There has been an increase in all categories. Specifically, there have been two additional positions at professorship level, one additional associate professor, six additional assistant professors, three additional lecturers and one additional assistant (SAR, p.327). These changes have been due to a combination of factors. One factor is replacement of retired staff but more importantly it reflects the promotion of staff due to excellence in research output. The significant increases at assistant professor, lecturer and assistant level brings improvements in the pedagogical approach that young teaching staff bring as part of their promotion activities.
Irrespective of staff turnover, the student:staff ratio is low, at 7.9:1 (SAR, p.329).

2.4.3. Not applicable to this professional bachelor study programme.

2.4.4. Overall the academic staff is involved in the processes of academic research. According to available information, the academic staff are continuously involved in producing research outputs and artistic achievements, and they have taken part in publications and/or relevant practical work experience (Study Field appendixes 2.3 and 2.4, as well as SAR p.316-324).

2.4.5. The Expert Panel noted during meetings with staff that a collegiate approach is taken to the implementation of the programme. This includes an annual review of course evaluations; joint attendance at methodological seminars; interactive discussions where staff share experience; and joint study tours where academic staff and students learn first-hand of recent developments in the field (SAR, p.329).

Conclusions on this set of criteria, by indicating strengths and weaknesses

The teaching staff associated with the programme are highly qualified in the specialisation. This includes a significant proportion of professorial staff being members of the Latvian Academy of Sciences and many staff members are members of the Institute of Heat, Gas and Water Technology.
Staff promotions and turnover has resulted in the enhancement of the academic standing of staff assigned to the programme in the reported period There has been an increase in all categories. The significant increases at assistant professor, lecturer and assistant level brings improvements in the pedagogical approach that young teaching staff bring as part of their promotion activities. Irrespective of staff turnover, the student:staff ratio is low, at 7.9:1.
A collegiate approach is taken to the implementation of the programme, including an annual review of course evaluations; joint attendance at methodological seminars; interactive discussions where staff share experience; and joint study tours where academic staff and students learn first hand of

recent developments in the field.

Strengths:
1. The majority of staff are members of the Latvian Academy of Sciences, the Institute of Heat, Gas and Water Technology or both.There is an excellent collegiate atmosphere.
2. Low student:staff ratio.

Weaknesses:
None noted.

Assessment of the requirement [7]

1 R7 - Compliance of the qualification of the academic staff and visiting professors, visiting associate professors, visiting docents, visiting lecturers and visiting assistants with the conditions for the implementation of the study programme and the requirements set out in the respective regulatory enactments.

Assessment of compliance: Fully compliant

CV’s of professors, associate professors, assistant professors, lecturer and one guest professor (SAR, p.318-326).

2.5. Assessment of the Compliance

Requirements

1 1 - The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard

Assessment of compliance: Fully compliant

Study programme Heat, Gas and Water Techology (42582) complies with Professional Higher Education Standard (Cabinet of Ministers No. 512) Study programme total volume 200 CP of which at least 142 CP are compulsory part covering overall educational, field theoretical, field practical study courses, at least 16 CP for restricted elective compulsory part, Traineeship at least 24 CP and at least 12 CP for Bachelor's thesis. Compliance with the study programme with the State Education Standard Annex No 6

2 2 - The study programme complies with a valid professional standard or the requirements for the professional qualification (if there is no professional standard required for the relevant occupation) provided if the completion of the study programme leads to a professional qualification (if applicable)

Assessment of compliance: Fully compliant

There is professional standard requirements for “The Civil Engineer of Engineer Systems”, this standard is brand new, and full compliance of the study courses has been mapped with the standard. See annex 7. Compliance with the Professional Standard (1).

3 3 - 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 561 , Paragraph two and Section 562 , Paragraph two of the Law on Higher Education Institutions.

Assessment of compliance: Partially compliant

Study course descriptions are well prepared and they contain all basic knowledge on the length, syllabus, learning outcomes, and evaluation methods in the study course. Nevertheless,

compulsory literature should be revised and updated, because some of the literature is from 2000s'. To create even better study course descriptions in the future RTU can consider adding a table which includes on what lecture, lesson what type of knowledge check will be held, and add more detailed descriptions on what will be learned in each lecture, lesson. Some descriptions contain the title of databases in Latvian See annex: 10_ENG.

4 4 - The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure according to which state recognised documents of higher education are issued.

Assessment of compliance: Fully compliant

Diploma issued complies with the state legislation. See annex of the study programme: diploma paraugs.

5 5 - 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 Higher Education Institutions.

Assessment of compliance: Not relevant

6 6 - 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 Higher Education Institutions.

Assessment of compliance: Not relevant

7 7 - 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 (if applicable).

Assessment of compliance: Not relevant

8 8 - 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

Academic staff has sufficient latvian language knowledge for implementing study courses, see annex : Confirmation of the state language.

9 9 - 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 (if applicable).

Assessment of compliance: Not relevant

10 10 - The sample of the study agreement complies with the mandatory provisions to be included in the study agreement.

Assessment of compliance: Fully compliant

Study agreements include all necessary parts set in legislation. See the annex: Study

agreements.

11 11 - The higher education institution / college has provided confirmation that students will be provided with opportunities to continue their education in another study programme or another higher education institution or college (agreement with another accredited higher education institution or college) if the implementation of the study programme is terminated.

Assessment of compliance: Fully compliant

The RTU has an agreement with LLU (Latvia University of Life Sciences and Technologies) that in case the study programme will be terminated students will be provided with option to continue studies in LLU. See file Agreement LLU and RTU. RTU in future should provide information about exactly which study programme students can continue their studies. This information also would be beneficial for the students.

12 12 - The higher education institution / college has provided confirmation that students are guaranteed compensation for losses if the study programme is not accredited or the study programme's license is revoked due to the actions (actions or omissions) of the higher education institution or college and the student does not wish to continue studies in another study programme.

Assessment of compliance: Fully compliant

RTU confirms that they will compensate losses for students in case of termination of study programme. See annex: Confirmation on compensation for losses.

13 13 - The joint study programmes comply with the requirements prescribed in Section 55.(1), Paragraphs one, two, and seven of the Law on Higher Education Institutions (if applicable)

Assessment of compliance: Not relevant

14 14 - Compliance with the requirements specified in other regulatory enactments that apply to the study programme being assessed (if applicable)

Assessment of compliance: Not relevant

Assessment of the requirement [8]

1 R8 - Compliance of the study programme with the requirements set forth in the Law on Higher Education Institutions and other regulatory enactments.

Assessment of compliance: Fully compliant

All regulatory requirements are met and fulfilled.

General conclusions about the study programme, indicating the most important strengths and weaknesses of the study programme

It is concluded that the professional bachelor study programme "Heat, Gas and Water Technology" (42582) meets the requirements. Significant actions have been taken by RTU to address all nine recommendations for the programme in the previous accreditation. The shortcomings presented in this report are ones which RTU may wish to address in the spirit of further enhancing the student experience by building on progress to date.
Currently the programme is implemented as a full-time study programme with a total length of five years and part-time study programme with a total length of six years. The awarded degree is the Professional Bachelor Degree in Heat, Gas and Water Technology and the qualification to be obtained is Building Engineering Systems Engineer in both the five years studies and part-time extramural studies.

As a general point, the Expert Group favour the full-time intramural form of higher education at the bachelor degree level in the Architecture and Construction study field so that the students can both learn from one another and develop individually to their fullest potential through the holistic university learning experience. Nevertheless, the financial pressure on Latvian university students is recognised and many are in employment during their studies. The benefits of part-time distance learning is acknowledged as an option, given the advances in e-learning technology and the need for HEI's to adapt to diverse learning styles. However, the importance of laboratory-based learning cannot be underestimated in engineering programmes. The strong emphasis on practical classes in the programme has recently been extended. Extensive refurbishment works, currently in progress, will further promote development of the practical component of the study courses and technologies available in the study process.
The learning outcomes have been improved since the previous accreditation and set out the knowledge, skills and competences to be achieved. Nevertheless, the phraseology could be improved to reflect the higher order of learning expected of the students as they progress through the stages of the programme.
The internships are very well organised and jointly supervised. However the learning outcomes and assessment criteria need to be more focussed on the aspects of learning that are unique to the internship period. This would ensure a 'level playing field' for all students, given that some internship hosts may provide more exposure to specialist technical facilities than others.
Some modules are taught in English.
The funding available to the study programme, funding sources and the use of funding ensures full implementation of the study process. However there is always space for improvement if further funding is provided. The 'wish-list' is for more site visits and interdisciplinary project work.

Strengths:
1. The academic staff are supported in developing student-centred practices through continuing professional development courses on pedagogical developments.
2. Provision of informative materials, availability of library resources.
3. The RTU e-platform ORTUS is functioning well as more e-learning tools are rolled out.
4. Well equipped workshop rooms.
5. The majority of staff are members of the Latvian Academy of Sciences, the Institute of Heat, Gas and Water Technology or both. There is an excellent collegiate atmosphere.
6. Low student:staff ratio.

Weaknesses:
1. Due to several reasons, the number of students is decreasing despite a comparatively large number of places that are funded by the state budget.
2. The phraseology of learning outcomes does not reflect the incremental higher order of challenge to the students as they progress up through the stages of the programme.
3. The learning outcomes of the internship lack specific focus to the aspects of learning that are unique to the internship period, as opposed to its contribution to the students learning of other module learning outcomes.

Evaluation of the study programme "Heat, Gas and Water Techology"

Evaluation of the study programme:

Good

2.6. Recommendations for the Study Programme "Heat, Gas and Water Techology"

Short-term recommendations

Long-term recommendations

Building on the improvements to date in relation to making the learning outcomes more specific, they should be further refined with phraseology that better reflects the level of the programme and the incremental higher order of learning expected of students as they progress up through the stages of the programme.
The learning outcomes of the internship should be refined to be more specific to outcomes that are uniquely achieved during the internship period.
Look for opportunities to design interdisciplinary group work between study programmes. Use a course specially for the Study Field, similar to the 'Vertically Integrated Project' as a way of getting students of architecture, civil engineering and heat, gas and water technology to work together on important interdisciplinary skills before they receive their degree and go into practice.
Look for opportunities to design modules in the existing study courses or add new courses to develop better skills in presenting students and young professionals work, communicating the principles of profession to other specialists and the general public.

II - "Transportation Engineering" ASSESSMENT

II - "Transportation Engineering" ASSESSMENT

2.1. Indicators Describing the Study Programme

Analysis

2.1.1. The professional bachelor study programme Transportation Engineering (42582) is held only in Latvian language. The programme's duration for full-time studies is 4 years and 6 months, for part-time extramural studies duration is 5 years. The programme's name and contents fits in and complies with the study field Architecture and Construction. Transportation engineers are able to define, describe and analyse practical problems in the field of transport infrastructure engineering, select the necessary information and use it in a clearly defined way to solve problems.

2.1.2. The total number of CP in the study programme is 180 CP which are equivalent to 270 ECTS. The study programme complies with the State Education standard set in rules of Cabinet of Ministers No. 512. (Annex RBCT0 6. pielikums_EN). In terms of admission requirements a general or vocational secondary education is required. These admission requirements are reasonable to select the best fitting applicants. The degree awarded is the Professional Bachelor Degree in Transportation Engineering and the qualification obtained is the one of Transportation Engineer. The aim of the study programme is to prepare competitive engineers in the field of transport infrastructure engineering. The programme's main tasks are to provide students with comprehensive knowledge, develop skills and develop competence following the requirements of the labour market, preparing students for practical work and promoting students interest in academic masters studies. The study programme, aims, objectives, learning outcomes and admission requirements are interrelated and can be achieved during the study programme's implementation.

2.1.3. During the reporting period 2017-2021, no changes were made to the programme parameters.

2.1.4. Study programme social and economic justification are based on the presumption that high qualification specialists are required, who can design roads, bridges, other transport structures, manage construction projects, maintain these structures in working order, conduct scientific research, and develop new theories and methods of civil engineering (see SAR 3.1.3 p. 371). The students from this study programme are in demand in the labour market, while the Experts Group concluded that they are also knowledgeable according to the testimony of employers during interviews. Student count that have been enrolled can be named as stable in previous accreditation period ~ 55 students are enrolled in full time studies and ~7 students are enrolled in part time studies. Each year approximately 50 students graduate the programme which indicates that only few of students drop out during the study period. RTU have indicated that most of the graduates work in private companies, municipal development departments and construction boards, design companies, public administrations and other sector-related organisations. And ~90% of graduates work in the field. Since graduates are working in different sectors it is very important to also develop their soft skills. During the site visit it was noticeable that students excel at the engineering part, but are lacking some soft skills. Employers also indicated that some sort of soft skill development could be beneficial for students. Another way to achieve this is via interdisciplinary projects with other study programme students, to develop a whole functioning project from the beginning until the end.

2.1.5. N/A

Conclusions on this set of criteria, by specifying strengths and weaknesses

The study programme complies with the State Education standard set in rules of Cabinet of Ministers No. 512. Admission requirements are reasonable to select best fitting applicants. Study programme graduates are demanded in the labour market. The Experts Group found from the interviews with employers that the students are knowledgeable, but they expressed their need to develop the students in terms of people's skills, i.e., the ability to de-escalate a situation through proper conversational skills and develop the ability to express themselves in the professional environment.

Strengths:
1. Students are highly evaluated among employers and in high demand.

Weaknesses:
1. Students are required to be trained accordingly in order to develop the ability to de-escalate a situation through proper conversational skills and to express themselves in the professional environment.

2.2. The Content of Studies and Implementation Thereof

Analysis

2.2.1 The objective of the professional bachelor study programme Transportation Engineering (42582) is to prepare engineering students specialising in the field of transportation to gain the qualification '2142 29 Transportation Engineer' (SAR, p.367 and p.376). The programme aims are set out clearly in seven statements setting out the expectations of graduate attributes (pp.369-370). The attributes are formed through modules on general education, specialist topics, humanities, social science and a second foreign language (SAR p.376). Compliance with state education standards is assured (SAR, p.377 and Annex 6), as is compliance with professional standards (SAR, p.377 and Annex 7). The programme is a pathway to the joint masters with VGTU in Lithuania 'Innovative Road and Bridge Engineering'.

The academic staff meet annually, under the guidance of the head of academic unit, to co-ordinate updating of the modules. The modules are well integrated and aligned with the programme outcomes through a planning map (SAR, Annex 9 and p.377).

The learning outcomes for each module are set out in a comprehensive descriptor template (SAR, Annex 10 and p.377). The descriptors are accessible to all relevant stakeholders through the ORTUS platform. The learning outcomes are adequate but the phraseology (especially the dominant verb in a sentence) could be improved to the benefit of students, those delivering the programmes and all those responsible for challenging the students to achieve their full potential.

The programme is the only such in Latvia (SAR, p.368). The research of the academic staff is highly relevant to practice and is published in the Baltic Journal of Road and Bridge Engineering (SAR, p.376), ensuring the topicality of the curriculum content.
2.2.2 Not applicable to this professional bachelor study programme.

2.2.3 The study implementation method is student-centred. There is a strong emphasis on independent study especially in the part time delivery of the programme. Lectures are combined with practical classes, field trips and visits to enterprises. Summative assessment is used (SAR, p.378). The internal quality assurance system operates effectively and includes student input. Students are surveyed through module questionnaires and the annual review at faculty level includes student representatives.

During the experts' meeting with the graduates it was noted that most students struggle with STEM subjects, in particular mentioning the subject of structural mechanics. Furthermore, it was indicated by the graduates that the overall programme focus is strongly aimed at teaching material aspects of “bridge construction”, and therefore could benefit from additional emphasis on social subjects, focusing on the impact of their work on the society, as well as practical soft skills (communication).

2.2.4 Internships are carefully organised on a student-centred case-by-case basis. Each student is given a defined task related to their internship host facilities and specific learning outcomes (SAR, p.381). The organisation of the internships is highly effective with prior consultation on the specific expertise of the host company to deliver the chosen learning outcomes. A tripartite contract (RTU-student-host) is signed off to comply with the requirements of regulatory enactments. Joint supervision is conducted by nominated supervisors in both the university and the host organisation. The university supervisor is the Head of Department unless the task is delegated. The internship is assessed based on reports and a presentation by the student. The assessment leads to a grade on a 10-point scale (SAR, p.381).

2.2.5 Not applicable to this professional bachelor study programme.

2.2.6 The final thesis includes a research paper and a transport infrastructure design project (SAR, p.382). The research paper is based on a topical issue in the field such as modelling service life material durability methods of risk assessment (SAR p.383). Students demonstrate in the design project the ability to design a road or bridge, including construction calculations, use of state-of-the-art materials and construction processes. Following approval by an internal review, solutions are presented in public before an Examination Committee. The quality of the final works has been judged to be of a very high standard based on 50% of the grade coming from the examination committee which includes employer representatives.

Conclusions on this set of criteria, by specifying strengths and weaknesses

The objective of the professional bachelor study programme is to prepare engineering students specialising in the field of transportation to gain the qualification '2142 29 Transportation Engineer' and is also a pathway to the joint masters with VGTU in Lithuania 'Innovative Road and Bridge Engineering'. The programme aims are set out clearly in seven statements which are achieved through modules on general education, specialist topics, humanities, social science and a second foreign language. Compliance with state education standards and professional standards is assured. The modules are well integrated and aligned with the programme outcomes.

The learning outcomes for each module are accessible to all relevant stakeholders through the ORTUS platform. The learning outcomes are adequate but the phraseology (especially the dominant verb in a sentence) could be improved to the benefit of students, those delivering the programmes and all those responsible for challenging the students to achieve their full potential. The programme is the only such in Latvia and the curriculum content is state-of-the-art.

The study implementation method is student-centred with a strong emphasis on independent study, especially in the part time delivery of the programme. Lectures are combined with practical classes, field trips and visits to enterprises. Summative assessment is used. The ongoing internal quality assurance system is effective and the annual review at faculty level includes student representation.

Many students struggle with STEM subjects, in particular 'Structural Mechanics'. Furthermore, it was indicated by the graduates that the overall programme focus is strongly aimed at teaching material aspects of "bridge construction", and therefore could benefit from additional emphasis on social subjects, focusing on the impact of their work on the society, as well as practical soft skills (communication).

Internships are carefully organised with each student given a defined task related to their internship host facilities and specific learning outcomes. A tripartite contract (RTU-student-host) is signed off to comply with the requirements of regulatory enactments. Joint supervision is conducted by nominated supervisors in both the university and the host organisation. The internship is assessed based on reports and a presentation by the student, leading to a grade on a 10-point scale. It could be argued that a pass/fail grade system might be fairer, given the possibility that not all students will have the same opportunities in the internship, with many factors outside of their control.

The final thesis includes a research paper based on a topical issue and a transport infrastructure design project of a road or bridge scheme. The quality of the final works has been assessed to be of a very high standard based gradings that include employer representatives.

Strengths:
1. Careful alignment of the learning outcomes of each internship with the learning outcomes of selected modules on a student-centred case-by-case basis.

Weaknesses:
1. The phraseology of learning outcomes does not reflect the incremental higher order of challenge to the students as they progress up through the stages of the programme.
2. The internship is assessed to a value on a 10-point grading scale. It could be argued that a pass/fail grade system might be fairer, given that not all students will have the same opportunities in the internship, with many factors outside of their control.

Assessment of the requirement [5] (applicable only to master's or doctoral study programmes)

1 R5 - The study programme for obtaining a master's or doctoral degree is based on the achievements and findings of the respective field of science or field of artistic creation.

Assessment of compliance: Not relevant

Not applicable to this bachelor degree programme

2.3. Resources and Provision of the Study Programme

Analysis

2.3.1. The study provision, both informative and material, technical, are compliant with the needs of the study programme Transportation Engineering (42582). Informative resources are available from RTU Scientific Library, online academic databases, e-books, e-journals. There is a procedure developed for convenient ordering of the resources from the library and a procedure for each student to request a limited amount of new materials of special interest (according to the information obtained from site visit meetings with the director of the study programme, academic staff and students).

In addition RTU ORTUS e-platform is a significant tool for student and teaching staff communication. ORTUS provides access for each student to all the data of the courses taken during the studies, and gives understanding of the course structure. Both students and teaching staff highly evaluate ORTUS. As for the material and technical provision, during the tour of facilities the expert group was impressed by the well equipped workshop rooms. Some of the lab rooms were in the process of relocation to newly refurbished facilities in the near future.

Furthermore, substantial investments have been made in research infrastructure, i.e. acquiring testing machines, a drone, high resolution camera (SAR, p.384). There is also a newly established laboratory that is working with 3D concrete printing (3x3m) that is used for research. At the same time it must be noted the experts learned that the equipment in some of the laboratories is not calibrated since it was moved, which brings up a question of the precision of these instruments.

2.3.2. N/A

2.3.3. The study programme is funded at a sufficient level to ensure full implementation of the study process. The funding and the cost per student has been increasing in the period of the study year 2017/2018 to 2020/2021 (SAR p. 387). However there is always space for improvement. For example as mentioned in the site visit meetings with the director of the study programme funding to attract guest lectures would be helpful. The study programme has the minimum number of students to ensure the profitability of the study programme. According to the annex to SAR On minimal number of students in study programmes there must be at least 19 students in first level, bachelor's level (including second level professional study programmes) – which is met and for 2020/21 was at 164 for the full time program (SAR, p.374). According to the annex to SAR Funding distribution between the cost items the major part (45%) is used for remuneration, leaving little funding for purchase and modernization of equipment. It leaves a question - is such distribution sustainable in the long term? It shows that the funding is not fully sufficient as such a great part is allocated for first necessities?

Conclusions on this set of criteria, by specifying strengths and weaknesses

The study programme has all the provisions for the implementation of the study programme. Especially at the level of HEI there is a decent provision of material, technical and digital resources.

At the same time, it is evident that the purchase and modernization of equipment would benefit from higher funding.

Strengths:
1. Good overall provision of resources, including the excellent library and access to academic databases.

Weaknesses:
1. Funding for equipment acquisition and regular calibration is too low.

Assessment of the requirement [6]

1 R6 - Compliance of the study provision, science provision (if applicable), informative provision (including library), material and technical provision and financial provision with the conditions for the implementation of the study programme and ensuring the achievement of learning outcomes

Assessment of compliance: Fully compliant

The study programme has all the necessary provisions for the implementation of the learning outcomes.

2.4. Teaching Staff

Analysis

2.4.1.Study courses delivery in this programme Transportation Engineering (42582), is based on the academic staff consists of: 9 professors and 3 associate professors of the Faculty of Civil Engineering, holding a degree of Doctors of Science (There is an inconsistency in the SAR, p.389. It is noted: ”3 associate professors holding a degree of Doctors of Science are involved in the implementation of the study programme”, but the CVs of two teachers are presented).

Figure 4.2.1. (SAR, p.388), relates to the dynamics of changes in the number of full-text publications by year, in the journals indexed in SCOPUS and Clarivate Analytics (2013 – 2020). It can be concluded that most of the publications were published in 2017 - 135, then 134 in 2020, and 122 in 2109. These data, as well as the CVs of teachers, are good quantitative and qualitative indicators for their involvement in educational and scientific research activities.

Comparing the mentioned references with legal requirements prescribed in Section 39 (p.23) of the Law on Higher Education Institutions Latvia, it’s obvious that this structure of academic staff is in line with the contents of this section.

The goal and learning outcomes are presented in details in SAR (p.364): “To prepare competitive engineers in the field of transport infrastructure engineering for their future profession...”, as well as “to be able to start their future career or to continue their studies in professional or academic study programmes; understand the relevant theories, regularities and technology of transport infrastructure; to be able to do practical tasks in transport infrastructure engineer’s profession; to be able to find creative solutions for professional problems,...“. Consequently, the analysis of the presented facts and figures leads to the conclusion that teachers with mentioned qualifications, are able to realise the study process, through successful achievement of aims and learning outcomes (in professional activity and in science).

2.4.2. The structure of the academic staff (2016/2017 and 2020/2021), is presented in the Table

(SAR, p.390). The significant changes are noticed in the number of professors which increase from 10 to 17, and in the number of lecturers (increase from 2 to 6). Therefore, the current composition consists of 17 professors – Doctors of science, 3 elected professors – Doctors of Science, 11 assistant professors, 6 lecturers. It is in line with the legal requirements. Reasons for changes in University academic staff composition are common and relate to promotions, retirement, leaving the academic environment and employment in the construction sector, changing the academic position to a leading researcher position. Measures which are taken by the University to minimise the impact of these changes on the everyday working refer to: activities for renewal the academic staff, involvement of doctoral students in realisation of study process, strengthening the qualifications of the existing teachers, invitation of professors from abroad to take part in delivering courses (Confirmed on the separate meetings with director of study programmes and teachers – 17th of February 2022).

It should be emphasised that the age structure is not shown in the Report.Usually, based on the average period of time needed for reaching the highest academic title, the professors' estimated age is around 60. This age structure is questionable for assuring a stable realisation of the study programme in the near future (for example, in 5 years from now).

2.4.3. N/A

2.4.4. Meeting of this criteria is assessed on the base of contents of various parts of SAR, as well as the additional materials provided by RTU. As it is noted and concluded in evaluation of previous parts regarding academic staff, the scientific research and professional activities of teachers make a good basis for successful study programme delivery. This is also confirmed by the results of analysis of documents on e-platform: Biographies of the teaching staff members (Curriculum Vitae in Euro pass format), Summary of quantitative data on scientific and/ or applied research and / or artistic creation activities corresponding to the study field in the reporting period, as well as the List of the publications, patents, and artistic creations of the teaching staff over the reporting period. Therefore, data presented on e-platform are not directed towards only on evaluation of the scientific research work, ("The most important publications of the academic staff during the reporting period"), but also on the involvement of teachers in artistic field, ("The most significant artistic creativity activities of the academic staff"), and creation of patents. (Publications_Patents_Creativity). Consequently, it can be concluded that teachers involved in this study programme meet the mentioned criteria. (see also Study field appendixes 2.3 and 2.4, as well as SAR p.384-387)

2.4.5. Different ways for mutual cooperation in processes of the study programme implementation, evaluation of the learning outcomes and achievement of performance indicators, are already mentioned in assessment of other study programmes. It's about regular meetings for discussions regarding study process, getting feedback from internal and external stakeholders (regular surveys, meetings, events) (The students pointed out the support they have from the teachers during their studies – meeting with students - 17th of February 2022). There is a need to include courses in the study programme that will contribute to developing non-technical skills (meetings with graduates and employers - 17th of February 2022). Employers are not involved in regular surveys, but there are various events during which the discussions are focused on the study programmes content (meeting with employers - 17th of February 2022).

Conclusions on this set of criteria, by indicating strengths and weaknesses

List of teachers who participate in realisation of this study programme, their professional

biographies, as well as presented results related to distributions of publications by year in the journals indexed in SCOPUS and Clarivate, are in line with the legal requirements for organising study programmes. Additionally, they are a good basis for successful achievement of aim and intended learning outcomes (“Implementing the professional bachelor’s study programme requires teaching staff, both with achievements in professional activity – in the design, construction, monitoring and maintenance of roads and bridges, and with advances in science to ensure the academic quality of the study process”).

Changes in the composition of teaching staff are monitored and measures for overcoming the possible issues are taken on a regular basis.

Measures for continuous, mutual cooperation of internal and external stakeholders in higher education (management team, teachers, students, graduates, employers), for further development of study programmes are put in place.

Members of teaching staff involved in realization of this study programme meet the requirements of criteria 2.4.4. (Joint Opinion).

Strengths:
1.The structure of the teaching staff ensures programme's sustainability in terms of the delivery of programme content.

Weaknessess:
1. Low level of involvement of external stakeholders (graduates, employers) in regular surveys.
2. The way of presenting the information that is important for proper and overall assessment of working in certain segments of study programme (age structure of the academic staff).

Assessment of the requirement [7]

1 R7 - Compliance of the qualification of the academic staff and visiting professors, visiting associate professors, visiting docents, visiting lecturers and visiting assistants with the conditions for the implementation of the study programme and the requirements set out in the respective regulatory enactments.

Assessment of compliance: Fully compliant

Law on higher Education, Latvia Section 39,p.23 Academic Staff of Vocational Study Programmes
Law on Higher Education Institutions, Section 39. Academic Staff of Vocational Study Programmes

2.5. Assessment of the Compliance

Requirements

1 1 - The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard

Assessment of compliance: Fully compliant

Study programme Transportation Engineering (42582) complies with Professional Higher Education Standard (Cabinet of Ministers No. 512). Study programme is 4 years (160 CP) or 4.5 years (180 CP) (5 years in extramural studies), consisting of general education courses worth of compulsory part 118 CP and compulsory elective part 17 CP, practical placement 20 CP, Development of the Bachelor Paper 19 CP. Theoretical basic courses and information technology

study courses 42 CP, Industry (area of professional activity) professional specialisation study courses 61 CP: Limited choice professional specialisation study courses 9 CP, free choice study courses 6 CP See annex 6.

2 2 - The study programme complies with a valid professional standard or the requirements for the professional qualification (if there is no professional standard required for the relevant occupation) provided if the completion of the study programme leads to a professional qualification (if applicable)

Assessment of compliance: Partially compliant

There is a professional standard for “Transport Construction Engineers”, partly compliance because standard is old (2004), however full compliance of the study courses has been mapped with the standard. See annex 7. Compliance with the Professional Standard (1).

3 3 - 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 561 , Paragraph two and Section 562 , Paragraph two of the Law on Higher Education Institutions.

Assessment of compliance: Partially compliant

Study course descriptions are well prepared and they contain all basic knowledge on the length, syllabus, learning outcomes, and evaluation methods in the study course. Nevertheless, compulsory literature should be revised and updated, because some of the literature is from 2000s'. To create even better study course descriptions in the future RTU can consider adding a table which includes on what lecture, lesson what type of knowledge check will be held, and add more detailed descriptions on what will be learned in each lecture, lesson. Some descriptions contain literature in Russian See annex: 10_ENG.

4 4 - The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure according to which state recognised documents of higher education are issued.

Assessment of compliance: Fully compliant

Diploma issued complies with the state legislation. See annex of the study programme: diploma paraugs

5 5 - 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 Higher Education Institutions.

Assessment of compliance: Not relevant

Not applicable

6 6 - 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 Higher Education Institutions.

Assessment of compliance: Not relevant

Not applicable

7 7 - 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 (if applicable).

Assessment of compliance: Not relevant

Not applicable

8 8 - 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

Academic staff has sufficient Latvian language knowledge for implementing study courses, see annex : Confirmation knowledge of the state language

9 9 - 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 (if applicable).

Assessment of compliance: Not relevant

Not applicable

10 10 - The sample of the study agreement complies with the mandatory provisions to be included in the study agreement.

Assessment of compliance: Fully compliant

Study agreements include all necessary parts set in legislation. See the annex: Studiju līgumi.

11 11 - The higher education institution / college has provided confirmation that students will be provided with opportunities to continue their education in another study programme or another higher education institution or college (agreement with another accredited higher education institution or college) if the implementation of the study programme is terminated.

Assessment of compliance: Fully compliant

The RTU has an agreement with LLU (Latvia University of Life Sciences and Technologies) that in case the study programme will be terminated students will be provided with option to continue studies in LLU. See file Agreement LLU and RTU. RTU in future should provide information about exactly which study programme students can continue their studies. This information also would be beneficial for the students.

12 12 - The higher education institution / college has provided confirmation that students are guaranteed compensation for losses if the study programme is not accredited or the study programme’s license is revoked due to the actions (actions or omissions) of the higher education institution or college and the student does not wish to continue studies in another study programme.

Assessment of compliance: Fully compliant

RTU confirms that they will compensate losses for students in case of termination of study programme. See annex: Confirmation - on compensation for losses.edoc

13 13 - The joint study programmes comply with the requirements prescribed in Section 55.(1), Paragraphs one, two, and seven of the Law on Higher Education Institutions (if applicable)

Assessment of compliance: Not relevant

Not applicable

14 14 - Compliance with the requirements specified in other regulatory enactments that apply to the study programme being assessed (if applicable)

Assessment of compliance: Not relevant

Assessment of the requirement [8]

1 R8 - Compliance of the study programme with the requirements set forth in the Law on Higher Education Institutions and other regulatory enactments.

Assessment of compliance: Fully compliant

Annexes to the SAR

General conclusions about the study programme, indicating the most important strengths and weaknesses of the study programme

It is concluded that the professional bachelor study programme “Transportation Engineering (42582)” meets the requirements. No major deficiencies were identified. The shortcomings presented in this report are ones which RTU may wish to address in the spirit of further enhancing the student experience by building on progress to date.

Currently the programme is implemented as a full-time study programme with a total length of 4 years and 6 months and part-time study programme with a total length of 5 years. As a general point, the Expert Group favours the full-time intramural form of higher education at the bachelor degree level in the study field so that the students can both learn from one another and develop individually to their fullest potential through the holistic university learning experience.

Nevertheless, the financial pressure on Latvian university students is recognised and many are in employment during their studies. The benefits of part-time distance learning is acknowledged as an option, given the advances in e-learning technology and the need for HEI’s to adapt to diverse learning styles. However, the importance of laboratory-based learning cannot be underestimated in engineering programmes.

The learning outcomes have been improved since the previous accreditation and set out the knowledge, skills and competences to be achieved. Nevertheless, the phraseology could be improved to reflect the higher order of learning expected of the students as they progress through the stages of the programme.
The internships are very well organised and jointly supervised. It is carefully organised with each student given a defined task related to their internship host facilities and specific learning outcomes.

The funding available to the study programme, funding sources and the use of funding ensures full implementation of the study process. However there is always space for improvement if further funding is provided. One of the priorities would be extra funding for equipment acquisition and regular calibration. The ‘wish-list’ is for more site visits and laboratory-based learning.

Strengths:
1. Students are highly evaluated among employers and in high demand.
2. Careful alignment of the learning outcomes of each internship with the learning outcomes of selected modules on a student-centred case-by-case basis.
3. Good overall provision of resources, including the excellent library and access to academic databases.

Weaknesses:
1. The phraseology of learning outcomes does not reflect the incremental higher order of challenge

to the students as they progress up through the stages of the programme.
2. Funding for equipment acquisition and regular calibration is too low.
3. Low level of involvement of external stakeholders (graduates, employers) in regular surveys.
4. The way of presenting the information that is important for proper and overall assessment of working in certain segments of study programme.
5. Professional standard for “Transport Construction Engineers” is old (2004) and should be revised to be compliant with the labour market needs.

Evaluation of the study programme "Transportation Engineering"

Evaluation of the study programme:

Good

2.6. Recommendations for the Study Programme "Transportation Engineering"

Short-term recommendations

Presentation and analysis of all relevant data for assessment of processes in the Institution is needed (age structure of the academic staff).
Increasing the level of external stakeholders (graduates, employers) involvement in regular surveys throughout explanation of the importance of the surveys and proving that their opinion makes difference and is taken into consideration when the programme is reviewed.

Long-term recommendations

Create study courses or joint projects where students can develop more soft skills. They also have to learn how to communicate with all involved parties and create public discussions not only to be great at engineering
Building on the improvements to date in relation to making the learning outcomes more specific, they should be further refined with phraseology that better reflects the level of the programme and the incremental higher order of learning expected of students as they progress up through the stages of the programme
Consideration should be given to assessing the internship as a pass/fail module rather than a value on a 10-point grading scale, given that not all students will have the same opportunities in the internship, with many factors outside of their control
Provide regular calibration of equipment and consider option to increase funding for equipment acquisition.

II - "Architecture" ASSESSMENT

II - "Architecture" ASSESSMENT

2.1. Indicators Describing the Study Programme

Analysis

2.1.1. Bachelor level study programme Architecture (43581) is a full time study programme with a total length of 3 years and 6 months held only in Latvian language. Study programme Architecture name and contents fits in and complies with study field Architecture and Construction.

2.1.2. Total amount of CP in the Bachelor level study programme Architecture (43581) is 140 which equals 210 ECTS. Study programme complies with the requirements set in Cabinet of Ministers No. 240. Admission requirements for enrolment are general vocational secondary education and additional entrance examination in drawing. RTU has provided AIP approval for additional entrance examination decisions from AIP No. 02000-2.2.1-e/22 on 21.03.2022. As the programme director indicated during the site visit - there are more applicants for the programme than study places, so the additional exam helps to better select the best applicants. The exam checks general drawing skills, perception about the space and demonstrates how applicants can create drawing based on its projection in planar plane. Degree awarded is Bachelor Degree of Engineering Science in Architecture. Study programme aims to provide basic knowledge and skills needed to work under supervision of a certified architect or to continue studies in a masters level programme. The study programme has several tasks, they are oriented on providing overall understanding of architecture theory, architects role in society and basic understanding of design. After graduation alumni meet several learning outcomes, they can design buildings and structures in accordance with customers needs or express their artistic creativity in building design. The study programme, aims, objectives, learning outcomes and admission requirements are interrelated and can be achieved in study programmes time frame. An open question is left about the possibilities of attracting international academic staff and integrating it with the implementation of the study programme keeping in mind that the programme is held only in Latvian.

2.1.3. During the previous accreditation period changes in the study programme have been implemented. Changes are related to rearranging study courses and are meaningful.

2.1.4. The construction industry in Latvia is still growing and expanding so architects are a demanded profession in the labour market, confirmed also by employers during discussions. To independently enter the labour market students are bound to enrol in and finish a Master level programme, to acquire qualification of Architect. Meaning that the professionals from this study programme will benefit to the needs of public and private sectors. (SAR 3.1.3.) Each year there are at least 50 students enrolled in study programme (40 at state funded places and more than 10 students are paying tuition fees). Student enrollment statistics are stable and show no decrease in previous accreditation period. (Annex: 5pielikums_Arh_RABA_Statistika_LV) Most students continue studies in the Master level programme and after graduation continue to work in the place where their internship was held. (SAR 3.1.3).

2.1.5. N/A

Conclusions on this set of criteria, by specifying strengths and weaknesses

The Study programme complies with necessary state legislation. Study programme's name, degree awarded are also interrelated. Study programme, aims, objectives, learning outcomes and admission requirements compliments each other and complies within the study field. Students are demanded in the labour market and student count has not significantly changed since previous accreditation.

Strengths:
1. Students are interested in the study programme, each year all state funded places are taken and there are no indicators that students may stop applying for the study programme.

Weaknesses:
1. None

2.2. The Content of Studies and Implementation Thereof

Analysis

2.2.1. The content of the academic bachelor programme Architecture (43581) is topical and generally related to the discourse in the field. This is ensured by a curriculum (Academic Bachelor programme “Architecture”, appendix 3.2) that covers the requirements set in binding provisions. The meetings with the academic staff and the director of the programme confirmed that the revision of study content takes place regularly (on an annual basis) and is held alongside the final thesis sessions. Furthermore, the revision of specific study courses, learning outcomes and study aims are discussed every semester among the academic staff to ensure their continued relevance to the field, and feedback from students is taken into account.

The curriculum consists of compulsory courses (162 ECTS), including topics such as engineering, mechanics, and maths to architectural design, composition, art history, and painting. Furthermore, students are offered a range of elective courses (30 ECTS) for further specialisation (SAR, p635). Thematically, the content of study courses is interconnected and complementary to each other, yet some of the elective courses in humanities might not necessarily be fully tailored to the field of architecture, as learned in experts meeting with the students and graduates.

Both according to the experts’ meeting with the employers, as well as upon the evaluation of additional material (additional documents provided by HEI upon experts’ request, items #9 and #10) indicate that the content of the Bachelor of Architecture studies generally meets the needs of the industry, labour market, and scientific trends. In particular, the expert group noted a strong integration with the labour market—the study programme ensures a robust set of skills and knowledge to make both the students and graduates competitive in the industry; their skillset being adequate for undertaking tasks at a professional level even before graduation.

At the same time, meeting with the students revealed that some elements of the curriculum are outdated and need to be revised. Especially the first year is fully based on hand drawing technique while the students prefer to use digital tools which they have to learn by themselves as a result. It was noted by the students that their education in terms of digital thinking and tools is limited to certain industry-oriented software, therefore leaving space for substantial improvement in terms of fundamental understanding of multiple digital tools and methods. This indicates a larger issue that the curriculum is too reliant on classic arts and subjects and teaching methods, which comes at the expense of lack of digital skills (Latvian Association of Architects evaluation, p.2).

Moreover, in the meeting with employers the experts learned that while students are equipped with good skills in terms of design, they can lack professional and philosophical understanding of the role of an architect—“what makes architect an architect”, and how is the role different from building engineers and similar professions, and therefore how they can work in multidisciplinary environment. This is echoed by the evaluation by the Latvian Association of Architects (recommendations #3 and 5), which indicates a structural deficiency in terms of introducing students to the nature of the architecture profession and the multiple ways of architecture’s engagement with the professional, scientific, artistic, and cultural fields, including a much needed emphasis of humanities subjects, such as critical thinking, philosophy, and anthropology.

2.2.2. N/A

2.2.3. The expert group observed that student centred learning is implemented. Specific for architecture, studio-based learning is observed in practical exercises of architectural design, where

each student can develop their individual design skills. The assessments are organised in a way that corresponds with contemporary pedagogical approaches in architectural education—students can present their work and receive feedback, and each project is discussed among students and staff members. During the meetings with the director of the study programme, the academic staff, students and graduates, the expert group repeatedly noted the close communication between all the involved parties, and mechanisms of mutual feedback and continuous improvement (SAR, p636).

2.2.4. N/A

2.2.5. N/A

2.2.6. The topics of the student thesis can be closely intertwined with the needs of municipalities and thus the Latvian economy, as indicated by the academic staff in the meeting with the experts. According to SAR, p.638-639, the thesis topics can also be focused on other topics relevant to the field. According to the meeting with the students and graduates, the topics of theses are developed in discussion between the academic staff and the students, yet a formal pedagogical mechanism of this process is lacking. As noted in the meeting with the academic staff, the collaborations with municipalities are designed to ensure the introduction of new ideas and perspectives from the academic setting.

Conclusions on this set of criteria, by specifying strengths and weaknesses

Overall the content of the study programme meets all the relevant regulations, and especially the needs of the industry; it is well composed and allows the students to meet the study objectives and to be much demanded in the labour market. The content of the programme is generally related to the discourse in the field and the contents of the studies are reviewed regularly with the involvement of the academic staff. At the same time there are elements of the curriculum are outdated and need to be revised, such as the hand drawing component and the overemphasis on classical arts, which needs to be questioned in the contemporary context. Likewise, the study contents might benefit from more focus on soft and multidisciplinary collaboration skills, including the broader examination on the multiple professional roles of the architect.

Strengths:
1. Formal mechanisms are implemented and functional for study content to be revised regularly by the academic staff, ensuring continuous relevance to the field.
2. Feedback system for students in relation to study content is well developed, and this is confirmed by the positive feedback by students and graduates.
3. The curriculum offers a broad range of design and engineering related courses, ensuring a well rounded skill set in design.
4. Cooperation with municipalities in developing thesis ensures the thesis respond to the needs of Latvian society and economy.

Weaknesses:
1. Strong integration with employment trends and labour market needs limits a more general awareness on the role of the architect and the exploration of alternative modes of architecture practice.
2. The topics and architectural representation methods of thesis projects indicate limited exploration of broader artistic, theoretical, and scientific ideas in the field, beyond the existing approaches and beyond the practical needs of the industry and/or municipalities.
3. Emphasis on classical arts, and especially hand drawing both as an important criteria of admission

exam, as well as during the first year is useful in the labour market to a limited extent, yet it does not fully match with the up-to-date realities of the field.
4. The allocated credit points for electives beyond technical and engineering disciplines is limited, the curriculum lacks subjects of humanities and social sciences.
5. Emphasis only on certain professional digital softwares prevents a much more fundamental and diverse understanding of emerging digital tools and methods in architecture.
6. A formal pedagogical mechanism for establishing topics of students' thesis is lacking.

Assessment of the requirement [5] (applicable only to master's or doctoral study programmes)

1 R5 - The study programme for obtaining a master's or doctoral degree is based on the achievements and findings of the respective field of science or field of artistic creation.

Assessment of compliance: Not relevant

Not applicable to this bachelors degree programme

2.3. Resources and Provision of the Study Programme

Analysis

2.3.1. The study provision, both informative and material, technical, are compliant for the study programme Architecture (43581). Informative resources are available from RTU Scientific Library, online databases, e-books, e-journals, Faculty of Architecture also has its own library and resource room (SAR p. 640). There is a procedure developed for convenient ordering of the resources from the library and a procedure for each student to request a limited amount of new materials of special interest (according to info from site visit meetings with the director of the study programmes, academic staff and students). In addition RTU ORTUS e-platform is a significant tool for student and teaching staff communication. ORTUS provides access for each student to all the data of the courses taken during the studies, and gives understanding of the course structure. Both students and teaching staff highly evaluate ORTUS. As for the material and technical provision, during the tour of facilities expert group was impressed by the well equipped workshop rooms for wood and carpentry, as well as scale modelling workshop. Each student is given 24/7 access to a workplace in the design workshop.

2.3.2. Not applicable.

2.3.3. The funding available to the study programme, funding sources and the use of funding ensures full implementation of the study process. However there is always space for improvement. For example, as mentioned in the site visit meetings with the director of the study programme funding to attract guest lectures would be helpful. Students in the site visit mentioned they would appreciate more field trips as this is crucial for raising the awareness and understanding for young architects. The funding and the cost per student has been increasing in the period of the study year 2017/2018 to 2020/2021, and the proportion of state funding has increased as well, 70% to 84% (SAR p. 641). According to the annex to SAR Funding distribution between the cost items the major part (45%) is used for remuneration, leaving for example the position of purchase and modernization of equipment with less than 1%. It leaves a question - is such distribution sustainable in the long term as such a great part is allocated for first necessities? The study programme has the minimum number of students to ensure the profitability of the study programme. According to the annex to SAR On minimal number of students in study programmes there must be at least 19 students in first level, bachelor's level (including second level professional study programmes) – which is met (each

year there are at least 50 students enrolled in study programme).

Conclusions on this set of criteria, by specifying strengths and weaknesses

Overall resources and provision of the study programme are compliant for the study programme. There is a decent provision of informative resources, a specialized library for the needs of the study field. Good material and technical provision, well equipped workshop rooms. Access to both informative and technical resources is ensured convenient. At the same time, it is evident that the study programme would benefit from higher funding or distribution of funding providing a greater percentage for positions to attract guest lectures, and provide more field trips for students.

Strengths:
1. Provision of informative materials, availability of library resources.
2. Well equipped workshop rooms.
3. 24/7 access to a workplace in the design workshop.

Weaknesses:
1. The funding available to the study programme, the distribution of it.

Assessment of the requirement [6]

1 R6 - Compliance of the study provision, science provision (if applicable), informative provision (including library), material and technical provision and financial provision with the conditions for the implementation of the study programme and ensuring the achievement of learning outcomes

Assessment of compliance: Fully compliant

SAR p.640-641. The study programme has all the necessary provisions for the implementation of the learning outcomes

2.4. Teaching Staff

Analysis

2.4.1. The qualification of staff enables the achievement of learning outcomes and meets all the relevant study requirements and regulations of the academic bachelor programme Architecture (43581).
The program is implemented by 30 teaching staff and visiting lecturers. Alongside full-time academic staff, part time lecturers and professors are involved in the implementation of the program to compensate for the changing number of students each academic term, with 6 part time members on average. (SAR, p.646). According to SAR p.642 and the information obtained during the meeting with the director of the study programme, the academic staff is generally split into two categories: full time academic staff and part time professors and lecturers who work in the industry, and this insures both high quality research output as well as an ongoing connection to the developments in the professional field. Qualified staff members are attracted from the industry, as well as hiring existing PhD students. At the same time, the director of the programme indicated the difficulty of attracting international staff, citing the lack of resources available to the study programme. Furthermore, the programme is implemented in Latvian, which makes the possibilities of atracting international staff limited to certain study activities. Furthermore, the study programme seems to lack connections to international networks of academics to attract foreign staff beyond Latvian architects with work teaching experience abroad, as evident in the list of foreign teaching staff on SAR p.62.

2.4.2. The institution purposefully ensures that changes in composition of teaching staff do not negatively affect the quality of the implementation of the study programme. In general the teaching staff numbers remain stable—over the last reporting period 6 new teaching staff have joined the program, and according to SAR p.646 and the conversations with the head of the programme, their research expertise has been successfully integrated in the study programme. Teaching assignments are organised in accordance to staff members' individual teaching loads and expertise. It must be noted that during the meeting with the academic staff, the experts noted a high degree of enthusiasm and motivation among the staff members. The academic staff are continuously involved in research and artistic achievements (Study Field appendixes 2.3 and 2.4). Their research topics are integrated with the formulation of study content and the topics of thesis (SAR, p.638-639, p642).

2.4.3. N/A

2.4.4. Overall the academic staff is involved in the processes of academic research and artistic creation, including exhibitions and publications. According to available information, the academic staff are continuously involved in producing research outputs and artistic achievements, and they have taken part in publications and/or relevant practical work experience (Study Field appendixes 2.3 and 2.4, as well as SAR p.641-645).

2.4.5. According to SAR p.645 and experts' meetings with both the director of the study programme and the academic staff, a mechanism for mutual cooperation is established among the staff. On the most fundamental level it is articulated via regular staff meetings and coordination of study content and necessary revisions. Both compulsory study courses and electives are organised in thematic blocks that are coordinated to avoid overlaps between them. Furthermore, cooperation mechanisms are based on balanced teaching loads of academic staff.

Conclusions on this set of criteria, by indicating strengths and weaknesses

Overall the staff of the programme is fully qualified in regard to the applicable requirements. The experts noted a high degree of motivation and interest in the study programme by the academic staff, as well as managements' ability to provide balanced teaching loads for the academic staff. Moreover, the involvement in scientific and artistic creation of the academic staff positively impacts the contents of the study programme, therefore it is encouraged to further develop such activities. At the same time, due to limited resources, long-term staff mobility both inwards and outwards remains a challenge, and the efforts by the study programme to attract international staff is challenging.

Strengths:
1. The study programme has fully qualified and motivated academic staff for meeting the learning outcomes

Weaknesses
1. The study programme lacks a robust strategy and concrete of mechanisms for attracting and involving international staff to the programme

Assessment of the requirement [7]

1 R7 - Compliance of the qualification of the academic staff and visiting professors, visiting associate professors, visiting docents, visiting lecturers and visiting assistants with the conditions for the implementation of the study programme and the requirements set out in the respective regulatory enactments.

Assessment of compliance: Fully compliant

Study Field appendixes 2.3 and 2.4, SAR p641-645

2.5. Assessment of the Compliance

Requirements

1 1 - The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard

Assessment of compliance: Fully compliant

Study programme Architecture (43581) complies with the State Academic Education standard (Cabinet of Ministers No. 240) Study programme consists of 108 CP for compulsory part, 20 CP of compulsory elective part, free elective part (2CP) and at least 10 CP are allocated for Bachelor thesis. Annex 6.pielikums_Arhitekti_Bak_RABA_LV. The allocation of CP was evaluated based on annex 0_RABA_Planojums_2021x.

2 2 - The study programme complies with a valid professional standard or the requirements for the professional qualification (if there is no professional standard required for the relevant occupation) provided if the completion of the study programme leads to a professional qualification (if applicable)

Assessment of compliance: Not relevant

Not applicable

3 3 - 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 561 , Paragraph two and Section 562 , Paragraph two of the Law on Higher Education Institutions.

Assessment of compliance: Partially compliant

Study course descriptions are well prepared and they contain all basic knowledge on the length, syllabus, learning outcomes, and evaluation methods in the study course. Compulsory literature should be revised and updated, because the abundance of literature is from 2000s'and some materials are older than 20 years. To create even better study course descriptions in the future RTU can consider adding table which includes on what lecture, lesson what type of knowledge check will be held, and add more detailed descriptions on what will be learned in each lecture, lesson.

4 4 - The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure according to which state recognised documents of higher education are issued.

Assessment of compliance: Fully compliant

Diploma issued complies with the state legislation. See annex RABA_dipl_LV

5 5 - 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 Higher Education Institutions.

Assessment of compliance: Fully compliant

There are at least 5 asoc. professors or professors involved in study programme implementation all together. See annexes :Apliecinājums - AL 55. pants par prof. skaitu akadēmiskās programmās

6 6 - 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 Higher Education Institutions.

Assessment of compliance: Fully compliant

This criteria is met and AIP has approved implementation of the study programme. See annex : P2_Nr_82_RTU_Bak_Arhitekt_par+250+stud.

7 7 - 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 (if applicable).

Assessment of compliance: Not relevant

Not applicable

8 8 - 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

Academic staff has sufficient latvian language knowledge for implementing study courses, see annex : Apliecinājums - valsts valodas prasme.

9 9 - 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 (if applicable).

Assessment of compliance: Not relevant

Not applicable

10 10 - The sample of the study agreement complies with the mandatory provisions to be included in the study agreement.

Assessment of compliance: Fully compliant

Study agreements include all necessary parts set in legislation. See the annex: Studiju līgumi.

11 11 - The higher education institution / college has provided confirmation that students will be provided with opportunities to continue their education in another study programme or another higher education institution or college (agreement with another accredited higher education institution or college) if the implementation of the study programme is terminated.

Assessment of compliance: Fully compliant

The RTU has an agreement with LLU (Latvia University of Life Sciences and Technologies) that in case the study programme will be terminated students will be provided with the option to continue studies in LLU. See file Vienosanās_LLU un RTU_Arhitektura_buvnieciba. RTU in future should provide information about exactly which study programme students can continue their studies. This information also would be beneficial for the students.

12 12 - The higher education institution / college has provided confirmation that students are guaranteed compensation for losses if the study programme is not accredited or the study programme’s license is revoked due to the actions (actions or omissions) of the higher education institution or college and the student does not wish to continue studies in another study programme.

Assessment of compliance: Fully compliant

RTU confirms that they will compensate losses for students in case of termination of study programme. See annex: Apliecinājums - par zaudējumu kompensāciju.

13 13 - The joint study programmes comply with the requirements prescribed in Section 55.(1), Paragraphs one, two, and seven of the Law on Higher Education Institutions (if applicable)

Assessment of compliance: Not relevant

Not applicable

14 14 - Compliance with the requirements specified in other regulatory enactments that apply to the study programme being assessed (if applicable)

Assessment of compliance: Not relevant

Not applicable

Assessment of the requirement [8]

1 R8 - Compliance of the study programme with the requirements set forth in the Law on Higher Education Institutions and other regulatory enactments.

Assessment of compliance: Fully compliant

All regulatory requirements are met and fulfilled.

General conclusions about the study programme, indicating the most important strengths and weaknesses of the study programme

Academic bachelor level study programme Architecture (43581) is a full time study programme held only in Latvian language, that provides basic knowledge and comprehension of Architecture and architects role in society. Study programme complies with the necessary legislation. Study programme aims to provide excellent theoretical knowledge for students, so they could continue studies in Masters level programme and obtain qualification. Study programme, aims, objectives, learning outcomes and admission requirements compliments each other and complies within the study field and RTU strategy. Knowledge and skills obtained from study courses meets the needs of the industry, but with some shortcoming, for example emphasis on classical arts, and especially hand drawing does not fully match with the up-to-date realities of the field. Collaboration projects with other study programme students may be beneficial to raise the competencies of young architects. There is a decent provision of informative resources, a specialized library for the needs of the study programme. Academic staff members are well qualified and a lot of them are involved in projects so they have the possibility bring the newest trends into the syllabus. At the same time, due to limited resources, long-term staff mobility both inwards and outwards remains a challenge, and the efforts by the study programme to attract international staff is challenging.

Strengths.
1. Study programme is demanded which is supported by steadily good enrollment statistics.
2. Study programme syllabus leads to broadly developed skill set of students.
3. Cooperation with municipalities has proven to be beneficial to meet actual labour market needs.

4. Premises are available for students 24/7.

Weaknesses.
1. Since a lot of students are working students may lack general awareness on the role of the architect and the exploration of alternative modes of architecture practice.
2. Not all study courses fully match with up to date trends of the architects profession.
3. Students may lack fundamental and diverse understanding of emerging digital tools and methods in architecture.
4. There is no concrete strategy for attracting and involving international staff into study programme implementation.

Evaluation of the study programme "Architecture"

Evaluation of the study programme:

Good

2.6. Recommendations for the Study Programme "Architecture"

Short-term recommendations

Long-term recommendations

The entrance examination based on hand drawing is too narrow to determine an architect's abilities in relation to the artistic, scientific, and professional developments in the field. It is therefore recommended expanding it into other exercises of problem solving, such as form, model making, and written assignment.
The study content is leaning strongly on the engineering, technical, and classical arts subjects. It should be complemented with a study modules that explains the multiple roles the architect can take, as well as humanities subjects.
A holistic course of more fundamental digital thinking possibilities should be introduced so students can explore the state of art digital technologies and approaches to architecture not only in terms of design or analysis, but also various modes of architectural representation (virtual reality, real time rendering, 3D image composition, rendering techniques, generative modelling, etc).
Look for opportunities to design interdisciplinary group work between study programmes. Use a course specially for the Study Field, similar to the ‘Vertically Integrated Project’ as a way of getting students of architecture, civil engineering and heat, gas and water technology to work together on important interdisciplinary skills before they receive their degree and go into practice.
Develop a robust and sustainable mechanism for attracting international academic staff, and integrating it with the implementation of the study programme.
Broaden the artistic, theoretical, and scientific exploration in regard to ideas and up-to-date discourse in the field, beyond the existing approaches and beyond the practical needs of the Latvian industry and/or municipalities

II - "Civil Engineering" ASSESSMENT

II - "Civil Engineering" ASSESSMENT

2.1. Indicators Describing the Study Programme

Analysis

2.1.1. The Academic Bachelor Study Programme Civil Engineering (43582), which is offered in the English language only, was licensed on 10.06.2020 (licence No. 04051-184) and is currently in the process of accreditation for a period of six years. The study programme was planned to begin its offerings in 2020, but this was shifted for 2021.
In order to receive the degree of this study programme 120 credits are needed to be completed (see Annex 9). The study programme is in compliance with the study field and its aims are in line with the strategic objectives of RTU. The study programme has been developed according to the Law on Higher Education Institutions of the Republic of Latvia and the Classification of Education of the Republic of Latvia.
The study programme aims to promote education export potential in the field of civil engineering. Innovative teaching and learning methods are employed in programme implementation – special focus is made on the development of practical skills and active use of modern technologies. The strategic aim foresees to ensure internationally competitive high-quality scientific research, tertiary education, technology transfer and innovation in civil engineering.

2.1.2. The study programme also uses the management system that is described in www.rtu.lv/content/view/5257/1874/lang,lv/, to assure quality of implementation and learning outcome accomplishment. Like before, the principles of the Latvian Qualifications Framework (LQF) and the European Qualifications Framework (EQF) are closely observed during the implementation and development of the study programme.
According to the programme’s structure, it is open to applicants with general or vocational secondary education, as well as B2 Upper-Intermediate level of English. The programme’s graduates will obtain a Bachelor of Engineering in Construction and Civil Engineering. Graduates are also prepared for further studies at the Master's level.
The aims, objectives, learning outcomes and admission requirements are interrelated. In order to achieve the aims of the programme, programme learning outcomes are defined (see planned learning outcomes in SAR).

2.1.3. This is a new programme that just started and intends to attract international students. No changes were made.

2.1.4. Based on a survey performed in Latvia, it was found that during the period of 2020-2024 the experts and combined forecasts predicted a further increase of the industry’s costs. For 2020-2022 this increase is estimated within a range of 1% to 5% per year, and by 2024 it could be reaching 6%. Combined with the construction’s industry growth, the economic and social justification of the study programme is found to be realistic.
The programme has enrolled 6 international students in the 2020/2021 academic year, but due to the pandemic restriction the students could not travel to Latvia. The countries where the students are coming from are Pakistan, Nepal, India, Azerbaijan and Sri Lanka (2 students from India).

2.1.5. N/A

Conclusions on this set of criteria, by specifying strengths and weaknesses

The development of an academic bachelor’s programme to attract international students is a promising development and the Experts Group is looking forward to re-evaluating the progress in

terms of academic achievements and the quality of the graduates.

Strengths:
1. The international outreach of the programme will help RTU to establish a footprint in the international academic society.

Weaknesses:
N/A

2.2. The Content of Studies and Implementation Thereof

Analysis

2.2.1. The academic bachelor study programme Civil Engineering (43582) was recently introduced (licensed in 2020) to provide a 3-year full-time study duration engineering degree programme in Latvia that is taught entirely through the English language. Recognising the need for this programme in a globally competitive higher education market, it is hoped that it will increase the number of international students at RTU. The timing of launch has been unfortunate with the first intake delayed by international travel restrictions related to the Covid-19 pandemic. Six applications from international students were approved but the viability of the programme needs 20 students. The analysis is therefore based on the planned approach set out in the SAR (pp.684-710, Annex 9 and Annex 10), together with comments from the Expert Groups meetings with university and programme leadership during the site visit.
Seven programme aims are framed around producing systematic thinkers specialising in the field of construction and civil engineering. Modules are mapped to programme outcomes to ensure that all requirements are met in respect of knowledge, skills and competence. The learning outcomes for each module are set out in a comprehensive descriptor template. The same comments apply as in the professional bachelors degree programme in civil engineering: the phraseology (especially the dominant verb in a sentence) could be improved to better challenge the students to achieve their full potential as they progress through the stages of the programme. Specifically there is a need to explicitly set out the incremental rise in expectations of learning and assessment criteria at each stage. Sentences beginning with phrases such as “The ability to ….” could usefully be replaced by phrases beginning with “define”, “infer”, “calculate”, “analyse”, “evaluate”, “design” etc., to reflect the increasing level of expectation from the learners as they progress through the programme.

2.2.2. Not applicable to this academic bachelor study programme.

2.2.3. The study implementation method envisages lectures, practical classes, field trips and visits to enterprises. Assessment is based on summative assessment, implemented in a student-centred learning and teaching approach. The approach is student centered using a cross-curricular learning approach. Full use is made of relevant software and distance learning tools. An important element is the use of actual case studies within the modules.

2.2.4. The Expert Group learned in meetings with management that the practical details of offering internships to students who may not have strong Latvian language skills has yet to be finalised. Internship is not currently applicable to this academic bachelor study programme.

2.2.5 Not applicable to this academic bachelor study programme.

2.2.6 It is intended that the final thesis project will assess the student’s analytical research competence in their chosen specialisation. The final examination is a 10 CP research paper. The

student is expected to demonstrate their ability to independently analyze data gathered from both technical literature sources and their scientific studies. Topics envisaged are reported in the SAR (p.696) and are representative of current and future challenges in the field.

Conclusions on this set of criteria, by specifying strengths and weaknesses

The intention of the academic bachelor study programme, taught entirely through the English language, is to increase the number of international students at RTU. The timing of launch has been unfortunate. International travel restrictions related to the Covid-19 pandemic delayed the launch. Six applications from international students were approved but the viability of the programme needs 20 students.
The seven programme aims, framed around producing systematic thinkers specialising in the field of construction and civil engineering, are appropriate to this type of programme. Modules mapping to programme aims is logical and complete. The learning outcomes for each module are set out in a comprehensive descriptor template and the same comments apply as in the professional bachelors degree programme in civil engineering. That is, the phraseology (especially the dominant verb in a sentence) could be improved to better challenge the students to achieve their full potential as they progress through the stages of the programme.
The study implementation method envisages lectures, practical classes, field trips and visits to enterprises. Assessment is student-centred using a summative assessment approach.
It is intended that the final thesis project will assess the student's analytical research competence in their chosen specialisation.

Strengths:
1. This programme, if successful, has the potential to significantly enhance the international reputation of RTU in a highly competitive global higher education market.

Weaknesses:
1. The phraseology of learning outcomes does not reflect the incremental higher order of challenge to the students as they progress up through the stages of the programme.

Assessment of the requirement [5] (applicable only to master's or doctoral study programmes)

1 R5 - The study programme for obtaining a master's or doctoral degree is based on the achievements and findings of the respective field of science or field of artistic creation.

Assessment of compliance: Not relevant

Not applicable to the Bachelor study programme.

2.3. Resources and Provision of the Study Programme

Analysis

2.3.1. The programme Civil Engineering (43582) is subject to a unversity-wide funding structure. RTU funding from the basic state budget is made up of the study base financing corresponding to the list of study programmes and the number of students; it is used to cover such expenses as utilities, taxes, infrastructure maintenance (including data for the Student and Graduate Register), purchase of equipment and supplies, staff remuneration, and funding for research activities.
The library, material and technical provision and financial provision correspond to specific features and conditions for the implementation of the study programme, create preconditions for achieving study results and indicate the possibility to ensure a quality study process.

Students are provided with remote learning opportunities using the digital capabilities, tools, libraries, literature and individual tasks of the ORTUS platform.
The ORTUS platform has well-organized teaching materials, literature, curriculum and correspondence with teachers and trainers. Learning outcomes are good.
Students learn modern teaching methods using such modern modelling and structural calculations computer programs as Autodesk AutoCAD, Axis, Robot, RFEM, Revit and others.
The measuring instruments purchased by the university and used in the training process are not fully calibrated. Their readings are not completely verifiable. During the test procedure, some measuring equipment is not working or is not ready for operation.
After completion of the construction, the RTU Ķīpsala campus is becoming modern engineering study centre in the Baltic States.
The issue of sustainable development is taken into account in the construction process of the campus.

2.3.2. N/A

2.3.3. RTU funding from the state basic budget for the provision of study seats in the respective academic year is distributed in accordance with the decision of RTU Senate “Methodology for the distribution and use of funding for the structural units of RTU in academic year 2020/2021”. The methodology (Appendix 16 of the list of Internal regulations) is reviewed and revised every year and is subjected to any necessary changes.
RTU has a decentralized budget, and each organizational unit is allocated a separate budget. In a general sense, a budget is a plan of revenues and expenditures for a specific period of time, work, event or function. The revenues and expenditures of RTU shall be administered in accordance with principles approved by the Senate or as stipulated by the vice-Rector for Finance.
The academic Bachelor study programme "Civil Engineering" has been implemented in academic year 2021/2022 after receiving the licence, admitting 6 students to the program. The plan was to start studies in the academic year 2020/2021, but unfortunately this was not possible (no foreign students were enrolled at the beginning of the academic year). In order to ensure the quality of the study process, the number of students required for the programme is 20 (SAR 3.1.4).
The financial provision corresponds to the specifics and conditions of the study program implementation, creates preconditions for achieving the study results and indicates the possibility to ensure a quality study process.
Minimum number of students to ensure profitability of the study programme:
For full-time intramural local students: 19 students.
For part-time intramural and part-time extramural local students: 15 students.
For full-time intramural foreign students: 12-20 students depending on the country of origin (i.e., paid tuition fees (European Union, Commonwealth of Independent States, other)).
RTU also ensures the implementation of study programmes with smaller number of students in those study programmes that are strategically important for RTU and the state, as well as in the new study programmes in their first years of implementation. In order to ensure the effectiveness of study programmes with small number of students classes are planned jointly for local and foreign students, if it is permitted by the specifics of the study course and the language of implementation, and other activities that do not lessen the quality of studies.

Conclusions on this set of criteria, by specifying strengths and weaknesses

Overall resources and provision of the study programme are compliant for the study programme.

Strengths:

1. The ORTUS platform has well-organized teaching materials, literature, curriculum and correspondence with teachers and trainers.
2. The technical provision of study materials, instruments, measuring equipment is sufficient and corresponds to the study plan and content.

Weaknesses:
1. 6 students are registered in the program this academic year. Studies were not started in the 2020/2021 academic year (no foreign students were admitted at the beginning of the academic year). In order to ensure the quality of the study process, the number of students required in the program is 12-20 students (depending on the country of origin).
2. Note on the availability of measuring instruments - the measuring instruments purchased by the university and used in the training process are not fully calibrated. Their readings are not completely verifiable. During the test procedure, some measuring equipment is not working or is not ready for operation.

Assessment of the requirement [6]

1 R6 - Compliance of the study provision, science provision (if applicable), informative provision (including library), material and technical provision and financial provision with the conditions for the implementation of the study programme and ensuring the achievement of learning outcomes

Assessment of compliance: Fully compliant

The study programme has all the necessary provisions for the implementation of the learning outcomes.

2.4. Teaching Staff

Analysis

2.4.1. For the programme Civil Engineering (43582), the University presentation of the total number of teachers per department, (SAR), is as follows:
Department of Building Structures – 11 academic staff members, including
3 professors, 2 associate professors, 5 assistant professors and 1 lecturer.
Department of Construction Mechanics - 4 academic staff members, including 1 associate professor, 1 senior researcher, 1 assistant professor and 1 lecturer.
Department of Computer Aided Engineering Graphics - 4 teaching staff members, (1 academic, 1 assistant professor, 1 practical assistant professor and 1 lecturer.
Department of Civil Engineering - 11 academic staff members, (1 associate professor, 4 assistant professors, 3 lecturers, 1 assistant, 2 research assistants).
Department of Construction Production - 8 academic staff members, including 2 professors, 2 associate professors, 2 assistant professors, 1 senior researcher and 1 researcher.
Department of Composite Materials and Structures – 4 members of academic staff (2 professors, 1 assistant professor and 1 lecturer).
Department of Building Materials and Building Products – 2 professors,
1 associate professor, 4 assistant professors, 1 senior researcher and 1 researcher).
Sufficiency and appropriateness of staffing supporting the programme is reflected through the provided data regarding their professional and academic knowledge as well as professional biographies, (part of the SAR). They comply with the legal requirements, (Chapter VI – Studies in an Institution of Higher Education, Section 55 – Study programmes – Law on Higher Education Institutions).
Participation in various events such as projects, conferences, international mobility programmes, are

the most commonly used ways for improving the level of qualification necessary for study courses delivering on the appropriate quality level.
Indicators relating to the number of papers, the main areas in which articles indexed in Scopus are published, as well as their citations are presented in the form of tables and figures. (SAR, p. 701, 702, 703).
Given the mentioned numbers, it's obvious that the academic staff who participate in this study programme is involved in publishing various articles, (290 in total with thematic areas oriented towards Engineering – 34,5%, Materials Science – 19,7%, Environmental Sciences – 9%). Furthermore, part of the mentioned papers is indexed in SCOPUS database, (Figure, SAR, p.702). The average citations are 4, 1 per publication, (2015 – 2021), while the number of citations per year varies, (7, 7 in 2016, 1, 8 in 2019, 0, 7 in 2020). – SAR.
The analysis of the data presented in the Figure, (SAR, p.702), indicates the fact that 2021 data on the number of the scientific publications of the academic staff members, involved in the implementation of this study programme, published in Scopus or WoS CC indexed journals shows a significant decrease, although there is an explanation that the 2021 data is incomplete. Therefore, during the meeting with teachers, (15th of February 2022), they were asked to explain the reasons for the significant decrease in the number of publications. Again, the answer was that these data are not completed yet.

2.4.2. Changes in the number of teachers involved in study programme realisation, as well as their academic positions, are not presented in SAR related to this Academic Bachelor study programme. It is apparent from the SAR, as well as from the discussions the expert group held with the directors of the study programmes, (15th of February, 2022), that the possibility of including professors from abroad is analysed. The main goal is providing the staff whose qualifications enable the fulfilment of the objectives of the study programme and intended learning outcomes. In addition, it should be emphasised that academic staff are satisfied with the University support in the development of their career. (Meeting with academic staff, 15th of February 2022).

2.4.3. N/A

2.4.4. The information necessary for evaluation of this criteria is not presented in the SAR. The mentioned relates not only to this study programme, but also for other programmes in Civil engineering, (except for doctoral studies). Consequently, the assessment is carried out on the base of data presented in different parts of SAR (especially on page 703) and documents in the form of annexes (Summary of quantitative data on scientific and/or applied research and / or artistic creation activities corresponding to the study field in the reporting period, as well as List of the publications, patents, and artistic creations of the teaching staff over the reporting period). The assessment results indicate the fact that teachers meet the requirements contained in this criterion (Study Field appendixes 2.3 and 2.4, as well as SAR p.695-701).

2.4.5. The application of the same mechanisms, (already mentioned in other study programmes in Civil Engineering) for fulfilling this criterion, is predicted.

Conclusions on this set of criteria, by indicating strengths and weaknesses

Teachers from several departments, (Department of Building Structures, Department of Construction Mechanics, Department of Computer Aided Engineering Graphics, Department of Civil Engineering, Department of Construction Production, Department of Composite Materials and Structures and Department of Building Materials and Building Products), participate in the realisation of this study programme. (Moreover, there are possibilities for including professors from abroad).

On the basis of the analysis of teacher's CVs, it can be concluded that this academic staff meet the legal requirements prescribed in the Law on Higher Education Institutions, (Section 55, "Study Programmes").
Academics create their career through participation in scientific research activities (projects, conferences, international mobility programmes, supervision of students' thesis). In addition, their professional skills and competencies are developed through: involvement in processes of organisation the professional events; attendance on the professional development courses; membersips in Latvian and international associations.
The number of 34 Doctors of Science, (SAR, p.707), to be involved in the implementation of the study programme is obviously even more than satisfactory. On the other hand, the Report does not provide the evidence of "building the composition" over the years.

Bearing in mind the data presented in SAR, as well as the annexes provided by RTU, it's obvious that the scientific research and artistic activities, as well as the professional experience of the academic staff are in line with the requirements of criteria 2.4.4.

Strengths:
1. The sufficient number of teachers, (34 Doctors of Science), involved in the implementation of the study programme.

Weaknesses:
1. There are no significant weaknesses for teaching staff in this study programme.

Assessment of the requirement [7]

1 R7 - Compliance of the qualification of the academic staff and visiting professors, visiting associate professors, visiting docents, visiting lecturers and visiting assistants with the conditions for the implementation of the study programme and the requirements set out in the respective regulatory enactments.

Assessment of compliance: Fully compliant

Law on Higher Education Institutions, Latvia, Section 55. In accordance with SAR, p.702, 13 professors and 7 associated professors, elected to academic positions in RTU departments, and experts in their field are involved in delivering this Academic Bachelor Study Programme. In addition, RTU provides AIP Conclusion - Civil Engineering - 02000 - 2.1.1_25.pdf,(No.1.10/75, from December 5, 2019), regarding the possibility of implementing the academic bachelor study program "Civil Engineering" at Riga Technical University.

2.5. Assessment of the Compliance

Requirements

1 1 - The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard

Assessment of compliance: Fully compliant

Study programme Civil Engineering (43582) complies with the State Academic Education standard (Cabinet of Ministers No. 240) Study programme total volume 120 CP of which at least 85 CP are compulsory part covering overall educational, field theoretical, field practical study courses, at least 21 CP for limited choice study courses part, at least 4 CP are free choice study courses and at least 10 CP for final, state examinations, which include a Bachelor Thesis. Compliance with the study programme with the State Education Standard Annex No 6

2 2 - The study programme complies with a valid professional standard or the requirements for the professional qualification (if there is no professional standard required for the relevant occupation) provided if the completion of the study programme leads to a professional qualification (if applicable)

Assessment of compliance: Not relevant

3 3 - 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 561 , Paragraph two and Section 562 , Paragraph two of the Law on Higher Education Institutions.

Assessment of compliance: Partially compliant

Study course descriptions are well prepared and they contain all basic knowledge on the length, syllabus, learning outcomes, and evaluation methods in the study course. Nevertheless, compulsory literature should be revised and updated, because some of the literature is from 1970-2000s'. To create even better study course descriptions in the future RTU can consider adding a table which includes on what lecture, lesson what type of knowledge check will be held, and add more detailed descriptions on what will be learned in each lecture, lesson. Some descriptions contain the title of databases in Latvian See annex: BBB0_EN.

4 4 - The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure according to which state recognised documents of higher education are issued.

Assessment of compliance: Fully compliant

Diploma issued complies with the state legislation. See annex of the study programme: Sample of the diploma

5 5 - 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 Higher Education Institutions.

Assessment of compliance: Fully compliant

There are at least 5 PhD holders implemented in study programme. See annex: Apliecinājums - AL 55. pants par prof. skaitu akadēmiskās programmās (Confirmation - on compliance of the academic staff)

6 6 - 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 Higher Education Institutions.

Assessment of compliance: Fully compliant

For academic study programmes - Opinion of the Council of Higher Education in accordance with Section 55, Paragraph two of the Law on Higher Education Institutions. See annex: AIP Conclusion - Civil Engineering - 02000-2.1.1_25

7 7 - 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 (if applicable).

Assessment of compliance: Not relevant

8 8 - 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

Academic staff has sufficient latvian language knowledge for implementing study courses, see annex : Confirmation_knowledge of the state language.

9 9 - 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 (if applicable).

Assessment of compliance: Fully compliant

Academic staff have sufficient English language knowledge for implementing study courses. Confirmation available in annex: Confirmation_knowledge of the foreign language.

10 10 - The sample of the study agreement complies with the mandatory provisions to be included in the study agreement.

Assessment of compliance: Fully compliant

Study agreements include all necessary parts set in legislation. See the annex: Study agreement.

11 11 - The higher education institution / college has provided confirmation that students will be provided with opportunities to continue their education in another study programme or another higher education institution or college (agreement with another accredited higher education institution or college) if the implementation of the study programme is terminated.

Assessment of compliance: Fully compliant

The RTU certify that the students of the academic bachelor study programme "Civil Engineering" of the Faculty of Civil Engineering of RTU will be provided with opportunities to continue their education in the professional bachelor study programme "Civil Engineering" of the Faculty of Civil Engineering of RTU if the academic bachelor study programme is discontinued.

12 12 - The higher education institution / college has provided confirmation that students are guaranteed compensation for losses if the study programme is not accredited or the study programme’s license is revoked due to the actions (actions or omissions) of the higher education institution or college and the student does not wish to continue studies in another study programme.

Assessment of compliance: Fully compliant

RTU confirms that they will compensate losses for students in case of termination of study programme. See annex: Confirmation on compensation for losses

13 13 - The joint study programmes comply with the requirements prescribed in Section 55.(1), Paragraphs one, two, and seven of the Law on Higher Education Institutions (if applicable)

Assessment of compliance: Not relevant

14 14 - Compliance with the requirements specified in other regulatory enactments that apply to the study programme being assessed (if applicable)

Assessment of compliance: Fully compliant

RTU has indicated that this study programme complies with Civil Engineering law (Pursuant to

Article 13 of the Civil Engineering Law). See annex: Compliance of the study programme with the specific regulatory framework of the relevant sector.

Assessment of the requirement [8]

1 R8 - Compliance of the study programme with the requirements set forth in the Law on Higher Education Institutions and other regulatory enactments.

Assessment of compliance: Fully compliant

All regulatory requirements are met and fulfilled.

General conclusions about the study programme, indicating the most important strengths and weaknesses of the study programme

The Academic bachelor study programme “Civil Engineering” is full-time studies, offered only in English language.
The study program aims to promote education export potential in the field of civil engineering, with special focus on the development of practical skills and use of modern technologies. The mentioned is in compliance with the aims of the study field. The graduates obtain a Bachelor of Engineering in Construction and Civil Engineering. They can continue their education at the Master’s level.

This is a new study programme which was planned to begin in 2020, but then it was shifted for 2021. The number of enrolled students in 2020/2021 academic is 6 international students, but the viability of the programme needs 20 students.

The analysis of intended learning outcomes leads to the conclusion that there is a need for improving the phraseology. Internship is not currently applicable to this study programme, and according to the intentions, the final thesis project will be directed towards assessing the student’s analytical research competence in the chosen specialisation.
When it comes to the resources and provision of this study programme, it can be said that there are remote learning opportunities, which (bearing in mind that these are foreign students and because of pandemic) are very useful for successful completion of this study programme.

The University ensures realization of the study programmes which are important for RTU or for the broader national interests, even with number of students that does not provide profitability.
The members of the teaching staff meet the legal requirements and the number of 34 Doctors of Science is beyond satisfactory.

The results of the assessment indicate that this study programme, as a whole, is characterised with potential (study programme indicators, its content and implementation, resources, teaching staff), which will strengthen the University internationalization and initiate the process of establishing international academic environment. On the other hand, the phraseology of learning outcomes, small number of students (6 enrolled students in this academic year), regular maintenance of the measuring instruments, are weaknesses which should be improved.

Evaluation of the study programme "Civil Engineering"

Evaluation of the study programme:

Good

2.6. Recommendations for the Study Programme "Civil Engineering"

Short-term recommendations

Long-term recommendations

Building on the improvements to date in relation to making the learning outcomes more specific, they should be further refined with phraseology that better reflects the level of the programme and the incremental higher order of learning expected of students as they progress up through the stages of the programme.
Look for opportunities to design interdisciplinary group work between study programmes. Use a course specially for the Study Field, similar to the 'Vertically Integrated Project' as a way of getting students of architecture, civil engineering and heat, gas and water technology to work together on important interdisciplinary skills before they receive their degree and go into practice.
Compulsory literature needs to be reviewed and updated (especially for obsolete publications from 1970-2000). We recommend not to include obsolete literature sources (older than 20 years) in the subject descriptions. Valid but older literature sources could be included in the list of additional literature sources as needed.

II - "Innovative Solution in Geomatics" ASSESSMENT

II - "Innovative Solution in Geomatics" ASSESSMENT

2.1. Indicators Describing the Study Programme

Analysis

2.1.1.This academic master study program Innovative Solution in Geomatics (45581) is a joint study program, which is implemented by Riga Technical University and Vilnius Gediminas Technical University. (agreement of 17 March 2014).

The compliance between study field "Architecture and Construction" and study program "Innovative Solution in Geomatics" is reflected through comparing their aims. The goal of the study field, (SAR,p.18), is " to provide comprehensively trained professionals in the field of architecture and civil engineering for the Latvian national economy, for working at public and private sector institutions of various levels, by promoting their inclusion on the labour market in compliance with the nationally developed standards of professions, as well as encouraging engagement in business operations, thus actively participating in creation and maintenance of new jobs". On the other hand, the goal of this joint study program, among other things, is directed towards providing professionals who will be able to apply "the latest specialised software and practical skills" in geodesy, cartography, photogrammetry, and land management.

In addition, as can be seen on Table 1.1,(p.19), there is a high level of interconnection between study programs in the field of "Architecture and Construction." This is a base for choosing the direction of further acquisition of knowledge, skills and competencies. (opportunity for choice of the speciality).

2.1.2.The study program characteristics, according the national legal regulations, (Law on Higher Education Institutions of the Republic of Latvia, Classification of Education of the Republic of Latvia, "Regulations on the Second Level Professional Education State Standard", decision "On Uniform Requirements for Study Programs of Riga Technical University", are, as follows (SAR,p.461,462,463):

title – “Innovative Solution in Geomatics”; code – 45581; type of the study program – Academic Master Study Program; study form – full-time studies; duration – 1 years, 6 months; degree to be acquired – Master of Engineering Science in Geomatics unfortunately diploma issued does not comply with Cabinet of Ministers No. 322. according to legislation based on programme code (45581) degree awarded should be - Engineering science in city development.; implementation language – English; volume of the program – 60 CP; structure of the program: compulsory study courses – 28 CP, compulsory elective courses – 12 CP, Master’s thesis – 20 CP; there are no free choice courses and practice. The goal of the program is in line with requirements for master study level (SAR, p.461), such as: “. . . to provide in-depth education in modern problems of geodesy, cartography, photogrammetry, land management. . . as well as to prepare students for further doctoral studies, (according to the fifth level of professional qualification in geodesy and cartography, Latvian Qualifications Framework and the 6th EQF level), . . .for pedagogical work. . . for independent practical work.”

The intended learning outcomes meet the standards for master level of study programs. Therefore (SAR, p.462), among the other things, graduates should be able to: “. . . demonstrate the basic and specialised knowledge characteristic of the geomatics sub-sector of the field of construction science and a critical understanding of this knowledge . . . corresponds to the highest level of achievement in geomatics; show the understanding of the most important concepts and regularities of the geomatics . . .; perform professional, innovative or research activities; . . . show a scientific approach to problem solving . . ..”

Admission requirements are in line with the standards for master level study program: ”Bachelor degree in geodesy, cartography, geomatics, geography, land management, forestry or geology, or comparable education”, as well as English language proficiency (SAR,p.463).

The results of applying data mapping is a good base for support and justification of the connections provided between qualifications of the study program, aims, objectives, learning outcomes and admission requirements. Namely, it’s about the analyses of the interaction between the goals and intended results with the standards and study program aims, (in 2018/2019 academic year), which contributed to finding places in study courses descriptions which should be improved. Moreover, close connections between numerous professional associations and academic environment are directed towards further development of study program. In addition, the Board of the Institute of Transportation Engineering is responsible for evaluation of students’ assessments, and on that basis making the decisions regarding possible changes and improvement of the study process. On the other hand, the opinion of the State Examination Commissions in relation with Master theses quality is also very useful in the processes of study program improvements.

Graduates of this master study program have access to Doctoral (PhD) studies.

2.1.3. Improvement of the program (based on the recommendations, Annex 3 – “Report on implementation of recommendations of the study direction “Architecture and Civil Engineering”), is carried out in following directions: uniform program management, procedures for assessment of learning outcomes, study courses content (in relation with the European education standards), assessment of the Master thesis. It should be emphasised that these processes have contributed towards further development of the quality assurance system as a whole (taking into account the opinion of various stakeholders - meetings with students, graduates, employers, 16th of February, 2022). In addition, based on the University regulation, “On the unified requirements for study programs at Riga Technical University”, as well as, recommendations of employers and program advisors, the improvements of study program structure is included.

2.1.4. In accordance with the results of survey organised by different European associations and bodies (SAR,p.470), can be concluded that there is a high demand for academically qualified geo professionals (State Land Service of Latvia, Latvian Geospatial Information Agency, Rural Support Service, Latvian State Forest Service, Maritime Administration of Latvia, State Joint Stock Company Latvijas Gaisa Satiksme). On the other hand, there is a need for additional efforts directed towards preparing these kinds of professionals.

Number of students enrolled in this study program is as follows: 7 students in 2016/2017, 13 in 2017/2018, 8 more students joined the program in 2018/2019 and in 2019/2020, 6 more students. Because of the pandemic, there was not able to organise delivery of study courses in the 2020/2021 academic year. The number of students from RTU is variable. (“ In 2016, all 7 students were from RTU, in 2017 - 6 students, inc. 4 RTU students. In 2018 – 8 students, inc. 6 from RTU, but in 2019 - 6 students, inc. 2 from RTU”), SAR, p.472. Number of graduated students in total is 27. It should be emphasised that students have the opportunity to participate in the international student exchange project Erasmus+.

2.1.5. The realisation of this study program “Innovative solution in Geomatics” is under the supervision of the Programme Committee which acts in accordance with the VGTU Study Programme Committee Provisions. It’s about a unique program, because there is no such program in other universities in Latvia and Lithuania.
The development and implementation of this study program is actually the practical realisation of “EU initiative for the creation of a spatial data infrastructure in each of the EU countries” (SAR, p.474). Furthermore, the creation and delivery of this study program is based on several documents and regulations:

the provisions of National Sustainable Development Strategy;
· the provisions of Strategy of Lithuanian Regional Policy;
· “The Bologna process – The European higher education area in the new decade”;
· “A framework for qualifications of the European higher education area”;
· Methodology for Assessing Implemented Study Programmes, Order of the Director of SKVC No. 1-01-162;
· UNESCO, OECD Guidelines for Quality Provision in Cross-border Higher Education, 2005;
· EFMD Recommendations for Quality Assurance in Higher Education Business Schools, 2011;
· EQUIS – European Quality Improvement System, The EFMD accreditation for International Business schools.

The study of geodesy has a long tradition within the academic environment of RTU, former Riga Polytechnic Institute (The Faculty of Civil Engineering in Construction, Department of Roads, Bridges and Aerodromes, later in Department of Roads, Bridges and Geodesy, Department of Roads and Bridges, Department of Transportation Structure). This program is now carried out in the Department of Geomatics, Faculty of Civil Engineering. There are three study programs organised in the frame of the Department: Professional Bachelor Study Program, Professional Master Study Program and this Joint Academic Master Study Program. The main scientific research activities of the teachers involved in this Department are in several directions, mentioned on page 475, SAR.

The organisation of study process in the frame of “Innovative Solution in Geomatics” is as follows: first semester is carried out at RTU, second at VGTU, third at RTU or VGTU, at the choice of the student. One semester covers 30 credits, the study program as a whole includes 90 ECTS (1 ECTS credit is equal to 26,67 contractual working hours).

The implementation of the study program at two higher education institutions is a good base for exchange visits between institutions, and it provides the opportunity for participation at one of the RTU or VGTU partner universities in the frame of Erasmus+ exchange programs.

Conclusions on this set of criteria, by specifying strengths and weaknesses

The compliance of the study field and the study program, in this part of the Expert Joint Opinion, is based on the analysis of their goals and interconnections.

Therefore, it can be concluded that there is a high level of compliance towards providing professionals for working in public and private institutions in geodesy, cartography, photogrammetry, and land management.

On the other hand, the connection between this study program and the study field "Architecture and Construction" provides opportunities for further education of graduates on various disciplines in the frame of the study field.

The characteristics of this study program is approved on the base of national legal acts, bearing in mind the compliance between: title, code, degree, type of the study program and study form, its duration, degree to be acquired, goals and learning outcomes, structure of the program, admission requirements, opportunities for further education on doctoral studies. The interrelations between these elements in the 2018/2019 academic year are supported by the results of applying data mapping.

In accordance with the University recommendations (Annex 3 – "Report on implementation of recommendations of the study direction "Architecture and Civil Engineering", and regulation, "On the unified requirements for study programs at Riga Technical University"), corrections towards uniform program management, procedures for assessment of learning outcomes, study courses content (in relation with the European education standards), assessment of the Master thesis, are made.

Labour market demands for academically qualified geo educated staff are high. On the other hand, there is a need for additional efforts towards attracting students to this study program (number of students is low). Otherwise, the sustainability of this program will be called into question.

This university joint study program is implemented on the basis of the agreement signed between the Faculty of Environmental Engineering of Vilnius Gediminas Technical University and Riga Technical University. It's a master study program implemented at both universities (first semester is carried out at RTU, second in VGTU, third at RTU or VGTU, at the choice of the student). Delivering of study courses is under the supervision of the Programme Committee which acts in accordance with the VGTU Study Programme Committee Provisions. Its uniqueness is reflected in the fact that there is no such program in other universities in Latvia and Lithuania. The organisation of such study programs is a great opportunity for participation at one of the RTU or VGTU partner universities, in the frame of Erasmus+ exchange programs.

Strengths:
1. This study program is unique in Latvia.

Weaknesses:
1. The program sustainability regarding the number of students enrolled.

2.2. The Content of Studies and Implementation Thereof

Analysis

2.2.1. The content of the academic joint master programme Innovative Solution in Geomatics (45581) is topical and generally related to the discourse in the field. This is ensured by cooperation with professional and international associations. Furthermore, this is ensured by a curriculum (academic joint master programme “Innovative Solutions in Geomatics”, appendix 3.2) that covers the requirements set in binding provisions. The meetings with the academic staff and the director of the program confirmed that the revision of study content takes place annually. Furthermore, the study programme administration coordinates the contents of the program with professional associations, which ensures a close coordination of the study content and the broader field (SAR, p.476).

The programme is organized in full time, its language is English, and takes 1 year and 6 months to complete. This time is split between Vilinius Tech ang Riga Technical University—the first semester takes place in Riga, the second one in Vilinius, and the third in Riga or Vilnius, depending on the choice of the student. Likewise, the final examination—masters thesis defence—takes place either in Riga or Vilnius (SAR, p.475). The curriculum includes compulsory study and elective courses, and is composed to provide theoretical knowledge and practical skills. Thematically, the content of study courses is interconnected and complementary to each other. (SAR, p.464).

Programme’s compliance with relevant regulations and standards is assured at SAR, p.479. Experts’ meetings with students and graduates confirmed the collaboration between RTU and VGTU (known as Vilinus Tech) as one of the positive factors in ensuring the study content being topical and related to the field. Furthermore, the meetings with academic staff revealed close cooperation in continuously revising the contents of the joint study program.

2.2.2. The awarded degree is based on achievements and findings in the field and is based on the final examination of the master thesis. This is ensured by cooperation with professional and international associations, regular reviews of the study content, as well as by feeding the study content with the research conducted by the academic staff. Furthermore, the topicality of study content is enriched by a range of events and conferences. Also the topics of the thesis are related to the latest developments and topics in the field (SAR, p.480-482).

2.2.3. The implementation of the study program takes place both in Riga and Vilnius, and depending on the semester students are located physically in either one of the cities. The expert group observed that student centered learning is implemented in both institutions, and channels of communication and coordination exist between the two institutions on multiple levels, including the heads of the program. Furthermore, students are able to express their wishes to the academic staff, and for their thesis project they can choose to be situated either in RTU or VGTU. According to SAR, p.482, the learning in the programme is based on dialogue and active involvement of students in the improvement of the study process. This was confirmed by the students and graduates who indicated close communication between all the involved parties, and the existence of mechanisms of mutual feedback and continuous improvement. At the same time it must be noted that relatively low enrolment numbers are limiting the possibilties of student peer-to-peer learning, and can become especially limiting during student mobility.

To ensure the implementation of the joint study program between Riga and Vilnius, the programme is fully taught in English. Experts’ meeting with all the involved parties who are involved in the implementation of the program left an impression of very good command of English. Furthermore,

all the course material provided to experts from both VGTU and RTU has been in English. At the same time, some of the students noted to the experts that while course descriptions are in English, some of the courses in RTU are not fully taught in English in the classroom, only having the course materials in English.

2.2.4. N/A

2.2.5. N/A

2.2.6. The final thesis consists of the final master thesis that explores relevant challenges of the scientific field, and outlined in SAR p.488-489. The relevance of the thesis is ensured by a public presentation to the examination commission which includes industry representatives. Furthermore, before the presentation of the thesis, a review takes place by members delegated by both RTU and VGTU (SAR, p.488). According to the information obtained during the experts' meeting with the graduates and employers, the thesis topics are relevant to the professional field.

Conclusions on this set of criteria, by specifying strengths and weaknesses

Overall the content of the study programme meets all the relevant regulations, it is designed to maximize the learning outcome by pooling resources available to both RTU and VGTU. Its curriculum is well composed and allows the students to meet the study objectives and to be much demanded in the labour market. However, the low number of students poses a great limit on peer-based learning and other pedagogical methods that require group work. While the nature of the joint programme ensures student mobility and exposure to diverse contexts, this need to be complemented by larger group sizes. The master thesis is developed in accordance with the up-to-date discourse in the field and is positively influenced by the research of the academic staff.

Strengths:
1. Programme is tailored for professionally both qualified and unqualified students.
2. Strong coordination between RTU and VGTU in implementing and revising the study content.
3. The contents of the study programme are strongly coordinated with professional associations and research activities of the academic staff.

Weaknesses:
1. Small groups of enrolled students limit the use of group learning methods.
2. Not all courses are fully implemented in English in RTU.

Assessment of the requirement [5] (applicable only to master's or doctoral study programmes)

1 R5 - The study programme for obtaining a master's or doctoral degree is based on the achievements and findings of the respective field of science or field of artistic creation.

Assessment of compliance: Fully compliant

The academic staff and students of the programme publish research findings and present their work at research conferences. The awarding of the degree takes account of the student's contribution to advancing the art and science of engineering as evidenced in their final thesis. This is confirmed by SAR, p. 481-482, Annex 3.2 and additional documents provided by HEI upon experts' request, item #10

2.3. Resources and Provision of the Study Programme

Analysis

2.3.1. Study programme Innovative Solution in Geomatics (45581) is supported by the Department of Geomatics, which is a part of the Faculty of Civil Engineering. Since this is an academic study programme, a large amount of lessons are focused on training student theoretical skills in different situations regarding geodesy, surveying, levelling, calculations etc. Students have access to a geodetic survey tool laboratory, which provides students with an abundance of different tools such as - Levelling instruments, tachymeters, laser scanners, gravimeter, drones with different cameras and sizes, GNSS receivers etc. All this equipment was demonstrated and shown during the site visit. Students confirmed that if they need they have the access for this equipement to complete research works, complete assignments and utilise them during field trips. Available equipement is with different levels of sufficiency. In this study level students are using more sophisticated and precise tools that are usually electronically controlled. Obtained data can also be transferred to a 3D environment, and as an example a geodesy laboratory showed 3D scanned and re-created Cēsu city castle, this equipement have been also used to measure and scan Rigas hydro electrostation dam cracks. Most of the instruments are dominated by the Leica company but a big opponent for delivering technologies is also Trimble technologies. To analyse and work with data students have access to special software licences, such as - ArcGIS Pro, Leica Infinity, Bentley Microstation. All learned skills are relevant to the industry and most of the students are working in the industry during their studies. Regarding laboratories, lecture halls, they are sufficient for the student amount and can provide students with a necessary study environment. Students have access to the premises of the whole faculty and the partner university. Regarding informational base and support for the study process each year the library purchases new books which include the latest developments of the industry and students can lend the books from the library. Besides that RTU have huge library with paper books and e-resources including database subscriptions such as Scopus, Web of Science, ProQuest Ebook central etc., which can be accessed or ordered on site or through ORTUS platform. Library premises also have been renewed and since the repairs more students have been attending the library. All the most important information and communication is held through the ORTUS platform. ORTUS is an excellent platform for providing all necessary materials and tests for the students and is flexible to organise study work for the lecturers. ORTUS also includes anti-plagiarism tools such as Turnitin, which can check student works with available internet resources and databases. This tool is also used to evaluate plagiarism for the final thesis. All internal agreements, communication and inquiries etc. can also be organised and managed via the ORTUS system.

2.3.2. N/A

2.3.3. RTU has determined that for the successful implementation and profitability of the study programme each study year has to contain at least 19 students in master level study programmes annex: On_minimal_number_of_students_in_study_programmes. Based on this study programme student statistics annex: 5. pielikums Studiju statistika 1.2_Inovativie each year there are approximately 6 students enrolled in both universities together. The Vilnius TECH and RTU web pages also indicates that tuition fee is only 4000 EUR and RTU has 5 state founded places but document (Studiju_programmememu_finansejuma_sadalijums) indicates that actual costs per student per year are 9896,37 EUR. Taking this into account RTU should raise the tuition fee for the study programme to be sustainable. Nevertheless, RTU in SAR 3.3.3. p. 496 indicates that Financial resources of the study programme “Geomatics” are sufficient for the study programme implementation and their usage is controlled regularly both on the part of the administration, and on the part of the RTU Vice-Rector for Finance, that indicates inconsistency.

Conclusions on this set of criteria, by specifying strengths and weaknesses

Premises, tools, information resources provided to students ensure to train measurement engineering specialists, with the up-to-date specialised knowledge in Geomatics, geodesy and cartography, related to creation, development and improvement of geodetic networks, with option to continue studies at doctoral level or work in an academic environment.

Strengths:
1. Provides students with advanced technique and software for practical works and developing final thesis.

Weaknesses:
1. No weaknesses indicated regarding available infrastructure. But student count is much lover than RTU have identified as minimal requirement for the study programme to be sustainable.

Assessment of the requirement [6]

1 R6 - Compliance of the study provision, science provision (if applicable), informative provision (including library), material and technical provision and financial provision with the conditions for the implementation of the study programme and ensuring the achievement of learning outcomes

Assessment of compliance: Fully compliant

Premises, infrastructure, available resources enables students to achieve study course and study programme outcomes.

2.4. Teaching Staff

Analysis

2.4.1. List of teachers involved in realisation of the academic master programme Innovative Solution in Geomatics (45581) (SAR, p.497), consists of those who are employed and elected to the academic positions at RTU, guest lecturers (work at other universities and enterprises – in the geodesic and cartographic sector and participate in the process of delivering certain study courses), Doctoral students (4 doctoral students – 23,5% of the total number of academic staff), and staff working on different research projects. Teachers are members of national and international association, Scientific Organising Committees and journal's editorial boards. Currently, there is one guest lecturer.

Figure (SAR, p.499) is titled "The number of scientific articles of the academic staff of the academic Master study Programme "Innovative Solutions in Geomatics„. Presented data relate for the period from 2015 to 2021, but it should be emphasised that there is no complete data for the last two years (2020 and 2021). In accordance with SAR, 57,9% of journals cited in SCOPUS database were Open Access journals. Among SCOPUS indexed articles 26,8% belong to Environmental Sciences, 15,9% to Engineering, 4,0% to Earth and Planetary Sciences. The average citation of the mentioned papers is 4,1 citations to 1 publication, 8,2% of publications are among the most quoted publications in the world, 12,9% of scientific articles are published in CiteScore top 10% journals (SAR, p.499).

The aim of this study programme (SAR, p.461) is "to provide in-depth education in modern problems of geodesy, cartography, photogrammetry, land management... as well as to prepare students for independent work in scientific research; to prepare students for further doctoral studies..."

Positive opinion regarding University support of teachers' professional career (participation in conferences, methodological seminars, courses, providing of literature), was expressed during the meeting with teachers (16th of February 2022).

There are 5 teachers per 8 students (ratio of students to teachers is 1,6) – SAR (p.504).

Therefore, the number of teachers involved in this study programme (presented in this Report), meet the legal requirements (Law on Higher Education Institutions Latvia, Section 55, p.29). Their CVs are a good base for the achievement of the aims and learning outcomes of the study programme and the relevant study courses.

When it comes to the number of teachers and their academic positions/academic degrees, it was confirmed that RTU has a lack of PhD holders. On the other side, all members of the academic staff from Vilnius Gediminas Technical University have doctoral degrees. Masters level lecturers are mostly involved in the practical works, under the supervision of their mentors.

In accordance with information provided in SAR, p.472, "It should be concluded that in the first year of programme implementation - 2016/2017, there were 7 students, in the second year, in 2017/2018 there was a larger number of students - 13. In 2018/2019 8 more students joined the programme and in 2019/2020 - 6 more students. However, in 2020 it was not possible to organise a student group due to restricted mobility opportunities caused by the pandemic", the conclusion is that the number of students is low. Therefore, sustainability was a main discussed topic during the meeting with directors of the study field – 16th of February 2022). Tthe directors confirmed that the number of students enrolling in this study programme is decreasing. The reasons for this situation, in addition to the pandemic, is insufficient knowledge obtained during secondary school. In their opinion, the future of this study programme is in attracting students from abroad. In case of closing this programme, students can enrol in RTU Professional Master Study Programme, or in Master Studies of Geotechnics at Vilnius Gediminas Technical University.

2.4.2.The analysis and characteristics of the academic staff (Figure, SAR, p.500), lead to the following conclusion: 3 professors – 17,6% (among them 3 guest visiting professors from VGTU); 8 associate professors – 47,1% (among them 4 guest associate professors VGTU – 23,6%); 2 assistant professors – 11,8%; 4 lecturers – 23,5%; 1 guest lecturer, VGTU – 5,9%.

The distribution of the academic degree is presented on the same Figure (11 teachers – 64,7% with doctoral degree, 7 VGTU, 6 with Master degree – 35,3%, 1VGTU).

When it comes to the age of teachers, 10 teachers – 58,8% (5 VGTU) are from 41 to 50, 11,8% are from 51 to 60 (2 teachers – 11,8%), 3 (1 from VGTU) or 17,6% are from 31 to 40.

The study programme has only been implemented in recent years. Therefore, no changes in the composition of teachers are observed. (SAR,p.502). On the other hand, it should be emphasised that the above-mentioned characteristics of the academic staff, as well as, the way of providing the teachers, (guest professors, associate professors and guest lecturers), bearing in mind that this is a joint study programme, is a good basis for ensuring the quality in realisation of a study programme, even in cases of changing the composition of teaching staff.

2.4.3. N/A

2.4.4. This study programme is implemented in cooperation between Riga Technical University and

Vilnius Gediminas Technical University. The teaching staff consists of employees at RTU, guest lecturers and Doctoral students (SAR, p.496). As it was mentioned in assessment of criteria 2.4.4. (within the other study programmes in Geomatics), qualifications of teachers meet the legal requirements and necessities for participation in different scientific and artistic activities according to evaluated criteria (Study Field appendixes 2.3 and 2.4, as well as SAR p.490-494).

2.4.5.The cooperation between teachers involved in realisation of this study programme is oriented towards discussions regarding structure of the programme, contents of the study courses, achievement of the intended learning outcomes. Therefore, regular meetings, (after each semester) are organised by the department responsible for implementation of this study programme. The main aim is evaluation of the progress of the study process (The results of regular students' surveys are taken into account. Bearing in mind the interdisciplinary nature of this programme and participation of many teachers from different organisational units and external stakeholders in its implementation, their opinion regarding organisation and realisation of the programme is also very useful). The mentioned was confirmed during the meetings with teachers, students and employers. (16th of February, 2022). Furthermore, at least once a semester, a meeting among faculty members of two universities (RTU and VGTU) is organised. State Examination Commission for the Defence of Master's Theses is responsible for organising the joint meeting, directed towards discussions related to the students' performance and evaluation of study programmes. Joint application for projects, as well as participation in preparing of various publications, is also common.

Improving teachers' methodological competencies was the goal of participation in the academic conference "Integration of Methodological and Scientific Work into the Study Process".

Conclusions on this set of criteria, by indicating strengths and weaknesses

A team focus during the discussions with the directors of the study programmes was the sustainability of this academic master study programme, regarding number of teachers involved in implementation of study courses, their academic degrees and academic positions, as well as, the number of students enrolling in the programme.

As a conclusion of the discussions, it can be said, when it comes to RTU, that there is a need for increasing the number of teachers with Doctoral degrees. The involvement of doctoral students in the realisation of practical classes is a good solution, but only upon the supervision of their mentors. Namely, it should be taken into account that this study programme is on master level. Besides the reasons for insufficient number of enrolled students, on which University has no major influence, there is a need for more study programme promotion, first of all when it comes to the opportunities for employment.

The expert group is pleased to note that there are different ways in which University supports the development of teachers' professional careers. In addition, the cooperation among members of academic staff in implementation of this study programme should be emphasised as a positive aspect.

Bearing in mind the data presented in SAR, as well as the annexes provided by RTU, it's obvious that the scientific research and artistic activities, as well as the professional experience of the academic staff are in line with the requirements of criteria 2.4.4.

Strengths:
1. Good collaboration among academic staff on one hand, students and employers on the other

hand in various processes of upgrading the study programme.

Weaknesses:
1. The number of teachers with Doctoral degrees is not satisfactory on RTU share in this study programme.

Assessment of the requirement [7]

1 R7 - Compliance of the qualification of the academic staff and visiting professors, visiting associate professors, visiting docents, visiting lecturers and visiting assistants with the conditions for the implementation of the study programme and the requirements set out in the respective regulatory enactments.

Assessment of compliance: Fully compliant

Law on Higher Education Institutions, Latvia Section 55, p.29 Study Programmes

2.5. Assessment of the Compliance

Requirements

1 1 - The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard

Assessment of compliance: Fully compliant

Study programme Innovative Solution in Geomatics (45581) complies with the State academic Education standard Cabinet of minister No. 240. Study programme is 1,5 years (60 CP), consisting of general education courses worth of 28 CP, compulsory elective courses in field 12 CP, and Masters thesis development 20 CP. See annex 6.

2 2 - The study programme complies with a valid professional standard or the requirements for the professional qualification (if there is no professional standard required for the relevant occupation) provided if the completion of the study programme leads to a professional qualification (if applicable)

Assessment of compliance: Not relevant

3 3 - 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 561 , Paragraph two and Section 562 , Paragraph two of the Law on Higher Education Institutions.

Assessment of compliance: Partially compliant

Study course descriptions are well prepared and they contain all basic knowledge on the length, syllabus, learning outcomes, and evaluation methods in the study course. Nevertheless, compulsory literature should be revised and updated, because some of the literature is from 2000s'. To create even better study course descriptions in the future RTU can consider adding a table which includes on what lecture, lesson what type of knowledge check will be held, and add more detailed descriptions on what will be learned in each lecture, lesson. See annex: 10_ENG.

4 4 - The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure according to which state recognised documents of higher education are issued.

Assessment of compliance: Partially compliant

Diploma issued does not comply with Cabinet of Ministers No. 322. Degree awarded should be -

Engineering science in city development. Diploma supplement does not include all necessary information. See point 13.

5 5 - 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 Higher Education Institutions.

Assessment of compliance: Fully compliant

There are 4 asoc. professors or professors involved in study programme implementation all together from RTU side. See annexes :Apliecinājums - AL 55. pants par prof. skaitu akadēmiskās programmememās and Akadēmiskajām studiju programmememām - Augstākās izglītības padomes atzinums.

6 6 - 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 Higher Education Institutions.

Assessment of compliance: Fully compliant

All requirements are met, see AIP letter : Akadēmiskajām studiju programmememām - Augstākās izglītības padomes atzinums.

7 7 - 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 (if applicable).

Assessment of compliance: Not relevant

Not applicable

8 8 - 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

Academic staff has sufficient latvian language knowledge for implementing study courses, see annex : Confirmation_knowledge of the state language.

9 9 - 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 (if applicable).

Assessment of compliance: Fully compliant

Academic staff has sufficient English language knowledge for implementing study courses. Confirmation available in annex: Apliecinājums - svešvalodu prasme.

10 10 - The sample of the study agreement complies with the mandatory provisions to be included in the study agreement.

Assessment of compliance: Fully compliant

Study agreements include all necessary parts set in legislation. See the annex: Studiju līgumi.

11 11 - The higher education institution / college has provided confirmation that students will be provided with opportunities to continue their education in another study programme or another higher education institution or college (agreement with another accredited higher education institution or college) if the implementation of the study programme is terminated.

Assessment of compliance: Fully compliant

Additionally RTU provided document: “Vienošanās protokols” between RTU and VGTU,which indicates that students will be able to continue studies in professional Master programme “Geomatics” or professional Master programme Civil engineering.

12 12 - The higher education institution / college has provided confirmation that students are guaranteed compensation for losses if the study programme is not accredited or the study programme’s license is revoked due to the actions (actions or omissions) of the higher education institution or college and the student does not wish to continue studies in another study programme.

Assessment of compliance: Fully compliant

RTU confirms that they will compensate losses for students in case of termination of study programme. See annex: Apliecinājums - par zaudējumu kompensāciju.

13 13 - The joint study programmes comply with the requirements prescribed in Section 55.(1), Paragraphs one, two, and seven of the Law on Higher Education Institutions (if applicable)

Assessment of compliance: Partially compliant

Diploma supplement that is issued does not comply with Cabinet of ministers No. 202. It does not indicate what agreement is set between RTU and Vilnius Technical university.

14 14 - Compliance with the requirements specified in other regulatory enactments that apply to the study programme being assessed (if applicable)

Assessment of compliance: Not relevant

Not applicable

Assessment of the requirement [8]

1 R8 - Compliance of the study programme with the requirements set forth in the Law on Higher Education Institutions and other regulatory enactments.

Assessment of compliance: Partially compliant

Not all criteria are fully met. Diploma supplement should be updated in accordance with Cabinet of ministers 202. Degree awarded should correspond with requirements from Cabinet of ministers No. 322. If these shortcomings are eliminated until the Study quality commission meeting. Then requirement can be changed to Fully compliant.

General conclusions about the study programme, indicating the most important strengths and weaknesses of the study programme

Overall the joint academic master study programme “Innovative Solution in Geomatics” fulfills all the relevant requirements, except the requirement P8, which is partially compliant—a minor deficiency that should be eliminated. In the analysis of the program, several insignificant shortcomings have been identified, most notably the low student enrolment numbers, which should be increased via promotion. Likewise, the academic staff with a doctoral degree should be increased. The programme must eliminate deficiencies in regard to some course material presented in classes not being fully in English.

Evaluation of the study programme "Innovative Solution in Geomatics"

Evaluation of the study programme:

Good

2.6. Recommendations for the Study Programme "Innovative Solution in Geomatics"

Short-term recommendations

The programme should ensure that all of its course content is fully in English
Compliance with requirement P8 should be resolved. Diploma supplement and degree awarded should comply with state legislation.
Finding new ways for increasing the number of students - promotional activities, open days for perspective students, offering scholarships for best candidates

Long-term recommendations

There is a need for increasing the number of teachers with Doctoral degrees.
There is a need for more study programme promotion, first of all when it comes to the opportunities for employment.
The programme must substantially increase its student numbers to make it sustainable and pedagogically viable

II - "Innovative road and bridge engineering" ASSESSMENT

II - "Innovative road and bridge engineering" ASSESSMENT

2.1. Indicators Describing the Study Programme

Analysis

2.1.1. The joint academic master study programme Innovative road and bridge engineering (45582) is implemented at Riga Technical University (RTU) and Vilnius Gediminas Technical University (VGTU) in accordance with the agreement concluded on 17 March 2014 (see Annex RBMI 0.4. pielikums_Kopīgās studiju programmememas atbilstība augstskolu likumam + līgums). The academic Master study programme Innovative road and bridge engineering (45582) is a full-time study programme with a duration of 1 year 6 month and is held only in English language. Study programme is compatible with this study field under the Construction part. Bridge engineers are working in close relations with civil engineers and other specialists in this study field.

2.1.2. The programme’s name and contents fits in and complies with the study field Architecture and Construction. The total number of CP in the study programme is 60 CP which are equivalent to 90 ECTS.
The study programme complies with the State Education standard set in rules of Cabinet of Ministers No. 240. (Annex RBMI0 6. pielikums). In terms of admission requirements a professional bachelor degree in civil engineering or professional bachelor degree in transportation engineering, or comparable education and English language proficiency at least B2 level are required. These admission requirements are reasonable to select the best fitting applicants.
The degree awarded is the master of engineering in construction and civil engineering, while the

study programme aims to prepare students with theoretical knowledge and practical skills to attain competencies relevant to road and bridge engineering. The programme's main tasks are to promote students' interest in scientific research, academic environment and ensure competitive education in accordance with international standards. Since this is a joint programme one of the tasks is to also develop international collaborations within the civil engineering industry. The study programme, aims, objectives, learning outcomes and admission requirements are interrelated and can be achieved during the study programme's implementation.

2.1.3. During the period 2017-2021, no changes were made to the programme parameters.

2.1.4. Study programme social and economic justification are based on the presumption that high qualification specialists are required, who can design roads, bridges, other transport structures, manage construction projects, maintain these structures in working order, conduct scientific research, and develop new theories and methods of civil engineering. (see SAR 3.1.3 p. 655). The students from this study programme are in demand in the labour market.

2.1.5. The implementation of the joint study programme is justified and monitored by a quality assurance committee which includes 3 members from RTU and 3 members from VGTU. Studies are mandatory in the partner university for at least 1 semester, so each university during the studies can provide their strongest input into the knowledge of students

Conclusions on this set of criteria, by specifying strengths and weaknesses

The study programme complies with the State Education standard set in rules of Cabinet of Ministers No. 240. (Annex RBMI0 6. pielikums). These admission requirements are reasonable to select the best fitting applicants. The implementation of the joint study programme is justified and monitored by a quality assurance committee which includes 3 members from RTU and 3 members from VGTU. The students from this study programme are in demand in the labour market.
The Experts Group found from the interviews with employers that the students are knowledgeable, but they expressed their need to develop the students in terms of soft skills, i.e., the ability to de-escalate a situation through proper conversational skills and develop the ability to express themselves in the professional environment.

Strengths:
1. Students and academic staff utilise and cooperate with the partner institution and bring the obtained experience back to the RTU.
2. Graduates were found to be knowledgeable and in great demand by employers.

Weaknesses:
1. Students' soft skills require improvement.

2.2. The Content of Studies and Implementation Thereof

Analysis

2.2.1. The objective of the joint academic master study programme Innovative road and bridge engineering (45582) is to provide additional research skills to graduates of the professional bachelors programmes in either Civil Engineering or Transportation Engineering and to provide an opportunity for international experience in their graduate studies. The programme aims are set out clearly in seven statements setting out the expectations of graduate attributes (pp.654). The attributes are formed through modules on general education, specialist topics, humanities, social

science and a second foreign language (SAR p.661). Compliance with state education standards is assured (SAR, p.662).
The academic staff meet annually, under the guidance of the head of academic unit, to co-ordinate updating of the modules. The module learning outcomes are well aligned with the programme outcomes (SAR, p.662 and Annex 8).
The learning outcomes for each module are set out in a comprehensive descriptor template (SAR, Annex 10 and p.663). The descriptors are accessible to all relevant stakeholders through the ORTUS platform. The learning outcomes are adequate but the phraseology (especially the dominant verb in a sentence) could be improved to the benefit of students, those delivering the programmes and all those responsible for challenging the students to achieve their full potential.
The research of the academic staff is highly relevant to practice and is published in the Baltic Journal of Road and Bridge Engineering (SAR, p.656), ensuring the topicality of the curriculum content.

2.2.2. Students specialise in one of six areas, ranging from geotechnics for bridges to composite materials (SAR, p.664). The awarding of the degree takes account of the student's contribution to advancing the art and science of engineering as evidenced in their final thesis.

2.2.3. The 60 CP programme includes a masters thesis of 20 CP, the minimum state examination standard, and 40 CP of study courses (26 CP compulsory, 12 CP field specific, 2 CP of pedagogy and psychology study courses). Three of the compulsory study courses are joint RTU/VGTU courses totalling 10 CP. Students must select three out of a choice of seven field specific courses of which six are joint RTU/VGTU courses. Thus most RTU students will take a total of 22 CP of joint study courses.
The study implementation method is student-centred. Lectures and practical classes combine with a significant amount of independent learning. The progress of students through the programme is monitored at the level of the individual student. Summative assessment is used (SAR, p.666). The internal quality assurance system operates effectively at several management levels. The quality system includes students through module questionnaires and the student self-government involvement in faculty reviews of the programme.
The implementation of the study program takes place both in Riga and Vilnius, and depending on the semester students are located physically in either one of the cities. The expert group observed that student centered learning is implemented in both institutions, and channels of communication and coordination exist between the two institutions on multiple levels, including the heads of the program. Furthermore, students are able to express their wishes to the academic staff, and for their thesis project they can choose to be situated either in RTU or VGTU.
To ensure the implementation of the joint study program between Riga and Vilnius, the programme is fully taught in English. Experts' meeting with all the involved parties who are involved in the implementation of the program left an impression of very good command of English. Furthermore, all the course material provided to experts from both VGTU and RTU has been in English.

2.2.4. The programme does not include internships.

2.2.5. Not applicable to this joint academic master study programme.

2.2.6. The final thesis comprises a research paper on a topical issue in the field such as developments in materials science, deformation analysis, design regulations for low volume roads (SAR p.669). Following approval by an internal review, solutions are presented in public before an Examination Committee. The quality of the final works has been judged to be of a very high standard based on 50% of the grade coming from the examination committee which includes employer representatives. All were assessed at 8 to 10 on a 10-point grading scale in the reported period (SAR, p.670).

Conclusions on this set of criteria, by specifying strengths and weaknesses

The objective of the joint academic master study programme is to provide additional research skills to graduates of relevant professional bachelor's programmes and to provide an opportunity for international experience in their graduate studies. The programme aims are set out clearly in seven statements. Compliance with state education standards is assured.
The module learning outcomes are well aligned with the programme outcomes.
The learning outcomes for each module are set out in a comprehensive descriptor template, accessible to all relevant stakeholders through the ORTUS platform. The learning outcomes are adequate but the phraseology (especially the dominant verb in a sentence) could be improved to the benefit of students, those delivering the programmes and all those responsible for challenging the students to achieve their full potential.
The research of the academic staff is highly relevant to practice and is published in the Baltic Journal of Road and Bridge Engineering, ensuring the topicality of the curriculum content.
Students specialise in one of six areas. The awarding of the degree takes account of the student's contribution to advancing the art and science of engineering as evidenced in their final thesis.
The study implementation method is student-centred. The progress of students through the programme is monitored at the level of the individual student. Summative assessment is used. The internal quality assurance system operates effectively and includes student involvement in annual reviews.
The programme does not include internships.
The final thesis comprises a research paper on a topical issue in the field. The quality of the final works has been judged to be of a very high standard, including the proportion of the grade coming from the examination committee which includes employer representatives. All were assessed at 8 to 10 on a 10-point grading scale in the reported period.

Strengths:
1. The quality of the final theses is of a very high standard, reflecting the motivation from topicality of research to practice and supervision by highly research-active academics.

Weaknesses:
None noted

Assessment of the requirement [5] (applicable only to master's or doctoral study programmes)

1 R5 - The study programme for obtaining a master's or doctoral degree is based on the achievements and findings of the respective field of science or field of artistic creation.

Assessment of compliance: Fully compliant

The academic staff and students of the programme regularly publish research findings and present their work at research conferences. The awarding of the degree takes account of the student's contribution to advancing the art and science of engineering as evidenced in their final thesis.

2.3. Resources and Provision of the Study Programme

Analysis

2.3.1. The joint master programme Innovative road and bridge engineering (45582) is implemented by both RTU and VGTU (also known as Vilnius Tech). This means that during the study period, students have the possiblity to access resources from both universities improving the quality of

meeting study objectives. On the side of RTU, the study provision, both informative and material, is compliant with the needs of the study programme. Informative resources are available from RTU Scientific Library, online academic databases, e-books, e-journals. There is a procedure developed for convenient ordering of the resources from the library and a procedure for each student to request a limited amount of new materials of special interest (according to the information obtained from site visit meetings with the director of the study programme, academic staff and students). Likewise, VGTU provides access to a library, computer suites, data processing infrastructure, and technical laboratories. (SAR, p.674)

In addition RTU ORTUS e-platform is a significant tool for student and teaching staff communication. ORTUS provides access for each student to all the data of the courses taken during the studies, and gives understanding of the course structure. Both students and teaching staff highly evaluate ORTUS. As for the material and technical provision, during the tour of facilities the expert group was impressed by the well equipped rooms. Some of the lab rooms were in the process of relocation to newly refurbished facilities in the near future.
Substantial investments have been made in research infrastructure at RTU, i.e. acquiring testing machines, a drone, high resolution camera (SAR, p.671). Furthermore, it was noted by the staff during the meeting with graduates, students, and academic staff, that there is a possibility of cooperating with industry partners to borrow specific equipment. There is also a newly established laboratory that is working with 3D concrete printing (3x3m) that is used for research. At the same time it must be noted the experts learned that the equipment in some of the laboratories is not calibrated since it was moved, which brings up a question of the precision of these instruments.

2.3.2. N/A

2.3.3. The study programme is funded at a sufficient level to ensure full implementation of the study process. The funding and the cost per student has been increasing in the period of the study year 2017/2018 to 2020/2021 (SAR p. 387). However there is always space for improvement. For example as mentioned in the site visit meetings with the director of the study programme funding to attract guest lectures would be helpful.
The costs for the students are covered by the state budget, and students are required to pay tuition fees. (SAR, p.659). In 2019/20, the cost per student was 6607 EUR per academic year, however the tuition fee was 2000 EUR per semester. According to the annex to SAR On minimal number of students in study programmes there must be at least 19 students in first level, bachelor's and master’s levels. According to SAR p.658, there have been 7 students enrolled in the programme in 2020/2021. Therefore, the programme does not meet the minimum number of students criteria, however, the SAR annex indicates that “RTU also ensures the implementation of study programmes with a smaller number of students in those study programmes that are strategically important for RTU and the state” which might be the case. It must be noted that the low enrolment numbers have been noted both in SAR p.657 and during the meetings with academic staff, the director of the study programme, as well as the students.

Conclusions on this set of criteria, by specifying strengths and weaknesses

The study programme has all the provisions for the implementation of the study programme. Especially at the level of HEI there is a decent provision of material, technical and digital resources. The joint master program also benefits from the resource pool available at VGTU. At the same time, it is evident that the purchase and modernization of equipment would benefit from higher funding. Furthermore, the programme has low student enrolment numbers that need to be addressed.

Strengths:
1. Good overall provision of resources, including the excellent library and access to academic databases.
2. Collaboration with VGTU provides extended access to divers equipment and resources.

Weaknesses:
1. Funding for equipment acquisition and regular calibration is too low.
2. Student enrolment numbers are low.

Assessment of the requirement [6]

1 R6 - Compliance of the study provision, science provision (if applicable), informative provision (including library), material and technical provision and financial provision with the conditions for the implementation of the study programme and ensuring the achievement of learning outcomes

Assessment of compliance: Fully compliant

The study programme has all the necessary provisions for the implementation of the learning outcomes.

2.4. Teaching Staff

Analysis

2.4.1. CVs of the teaching staff members involved in study programme's Innovative road and bridge engineering (45582) implementation (RTU and VGTU), number of scientific articles (2015-2021), dynamics of citations of the scientific articles for the same period and other facts and figures relevant for assessment of teachers' qualifications are presented in the SAR.
In accordance with SAR p.679, number of teachers participated in study courses delivery (from RTU and VGTU), is as follows:
RTU: 2 professors and 2 associate professors – Doctors of Science, 1 elected associate professor – Doctor of Science, 1 assistant professor - Doctor of Science.
VGTU: 4 professors and 3 associate professors – Doctor of Science
The number of scientific articles by year, for the period of 6 years (2015 -2021), is presented in Figure 4.2.2. (SAR, p.676). It can be concluded that the total number of the articles published in journals indexed in the SCOPUS database is 183 (most papers have been published in 2017. 8,2% of publications were among the top 10% of the world's most quoted publications). Data for 2020 and 2021 are not completed. In addition, Figure 4.2.3. (p.677), shows the dynamics of changes of citations per article, (2015 – 2021) – an average 4,1 citations to 1 publication (The most cited publications of the academic staff is a part of the Report, too – p.677). When it comes to the number of scientific articles, the question arises regarding 2020 data. Namely, it is understandable that the 2021 data for the number of scientific articles to be incomplete, but, obviously it should not be the same for 2020 data.
The analysis of the presented teachers' qualifications, as well as their competences developing through participation in: study courses delivery abroad, various working groups and committees indicates that they are in line with the aim and intended learning outcomes of this study programme ("The programme shall aim at preparing students for independent scientific research activity, providing academic education in order to prepare further doctoral studies, teaching activities of higher education or practical work in the field of transport infrastructure engineering" SAR, p.649). When it comes to the results of the study programme, graduates should "be able to show a specific basic and specialised knowledge in the Civil Engineering science discipline and a critical understanding of this knowledge. A part of the knowledge conforms to the highest level of

achievement in the field of Transport and Traffic Sciences" (SAR, p.650).
University supports the teachers' qualifications improvement through opportunities for participation in methodological courses, seminars, conferences, projects. The mentioned was confirmed during the meeting with teachers (17th of February, 2022).
The ratio, number of permanently employed and elected teachers/students is approximately 1 to 2 (SAR, p.681). Additionally, the number of enrolled students is: 7, (2016/2017), 5, (2017/2018), 0, (2018/2019), 0 (2019/2020), 7(2020/2021), Figure 1.2.3. (SAR, p.659). Although the ratio teachers/students is beyond satisfactory, the number of students enrolled is low.

2.4.2. Changes in composition of the academic staff involved in realisation of this study programme is given in Table 4.1.1. (SAR, p.680). By comparing the data for two academic years (2016/2017 and 2020/2021), it can be said that there are no changes in the number of teachers and their academic positions (6 professors, 5 associate professors, 1 assistant professor).
Various measures for decreasing the impact of composition of the teaching staff on realisation of this study programme are the same as they which were mentioned in assessment of previous study programmes (involvement of doctoral students in delivering study courses under the supervision of their mentors - mainly for practical classes, invitations to foreign academic staff, improvement of teachers' qualifications, internships at an economic operator). (Confirmed during the discussions with the director of the study programme and teachers – 17th of February, 2021).
Again, as it was observed for the "Professional Master Study Program" in Transportation Engineering, the age structure is not presented in the Report. Usually, based on the average period of time needed for reaching the highest academic title, the professors' estimated age is around 60. This age structure is questionable for assuring a stable realisation of the study programme in the near future (for example, in 5 years from now).

2.4.3. N/A

2.4.4. This Academic Master study Programme is organized as a result of collaboration between Riga Technical University and Vilnius Gediminas Technical University. Detailed presentation of teachers' professional work, (from both universities), is provided in SAR, (p.677). In addition, the evaluation of data in materials provided on e-platform leads to the conclusion that this academic staff meet the requirements of this criteria. (publishing of papers in the last six years, participation in artistic activities, five years of practical experience) (Study Field appendixes 2.3 and 2.4, as well as SAR p.669-674).

2.4.5. Mutual cooperation among teachers, in the process of realisation of this study programme, is observed. This opinion is based on the content of the SAR (p.681), as well as on the results of meetings with academic staff (17th of February, 2022). In order to ensure regular and effective functioning of this programme, RTU and VGTU, as partner's institutions, established a council consisting of three representatives of the academic staff of each University. The meetings will be organised on a regular basis, (twice a year), and the topics regarding quality of studies, structure of the academic staff, programme upgrading will be discussed.
Additionally, there is a possibility for realisation of internships between researchers in RTU and VGTU.
In accordance with the discussions during the meetings with graduates and employers (17th of February 2022), there is a need to organise regular surveys for graduates and employers. The expert group could not detect evidence of sufficient involvement of the external stakeholders in the process of regular surveys, as one way of taking into account the opinion and/or the needs of real sector and alumni.

Conclusions on this set of criteria, by indicating strengths and weaknesses

Qualifications of the teaching staff meet the legal requirements and provide successful realisation of the study programme, bearing in mind the aim and intended learning outcomes. The structure of the staff is a mixture of teachers from RTU and VGTU, and it is a good base for further development of this study programme in the direction of design, monitoring and maintenance of roads and bridges, as well as, advances in science. Bearing in mind the presented data regarding the number of scientific publications for 2020, it should be emphasised that there is a need for updating the database.
The structure of the academic staff (when it comes to the number of teachers and their academic position), is presented in the Report. On the other side, the age structure, which is missing, is a very important indicator for sustainability of the programme.
Mutual cooperation among teachers, regarding implementation of the programme, its successful realisation, as well as, regular reviewing and upgrading (among the other things), is based on the legal body (council), that consists of representatives of the academic staff of each University (RTU and VGTU). In addition, there is a need for higher levels of involvement of graduates and employers in regular surveys.

The professional biographies of teachers involved in realization of this study programme are in line, (SAR, additional materials), with the requirements of criteria 2.4.4.

Strengths:
1. The structure of the teaching staff ensures programme's sustainability in terms of programme content delivery.

Weaknesses:
1. Study programme sustainability regarding number of enrolled students.
2. Low level of involvement of external stakeholders , (employers, graduates) in regular surveys.
3. The way of presenting the information that is important for proper and overall assessment of working in certain segments of study programme, (age structure).

Assessment of the requirement [7]

1 R7 - Compliance of the qualification of the academic staff and visiting professors, visiting associate professors, visiting docents, visiting lecturers and visiting assistants with the conditions for the implementation of the study programme and the requirements set out in the respective regulatory enactments.

Assessment of compliance: Fully compliant

Law on Higher Education Institutions, Latvia, Section 55, Study Programmes

2.5. Assessment of the Compliance

Requirements

1 1 - The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard

Assessment of compliance: Fully compliant

Study programme complies with the State Academic Education standard (Cabinet of Ministers No. 240). Study programme total volume 160 CP (equal 240 ECTS) for 4 years of which at least 118 CP are compulsory part covering overall educational, field theoretical, field practical study

courses, traineeship at least 20 CP, development of the Bachelor Paper 19 CP. Study programme for 4,5 years is also available (5 years in extramural studies).
Compliance with the study programme with the State Education Standard Annex No 6 RBCSO

2 2 - The study programme complies with a valid professional standard or the requirements for the professional qualification (if there is no professional standard required for the relevant occupation) provided if the completion of the study programme leads to a professional qualification (if applicable)

Assessment of compliance: Not relevant

3 3 - 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 561 , Paragraph two and Section 562 , Paragraph two of the Law on Higher Education Institutions.

Assessment of compliance: Partially compliant

Study course descriptions are well prepared and they contain all basic knowledge on the length, syllabus, learning outcomes, and evaluation methods in the study course. To create even better study course descriptions in the future RTU can consider adding a table which includes on what lecture, lesson what type of knowledge check will be held, and add more detailed descriptions on what will be learned in each lecture, lesson. See annex No 10. Descriptions of the study courses/ modules

4 4 - The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure according to which state recognised documents of higher education are issued.

Assessment of compliance: Partially compliant

Diploma supplement that is issued does not comply with Cabinet of ministers No. 202. It does not indicate what agreement is set between RTU and Vilnius Technical university.

5 5 - 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 Higher Education Institutions.

Assessment of compliance: Fully compliant

There are 2 asoc. professors or professors involved in study programme implementation all together from RTU side. See annex: Confirmation on compliance of the academic staff.

6 6 - 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 Higher Education Institutions.

Assessment of compliance: Fully compliant

All requirements are met, See anex: Confirmation - on compliance of the academic staff.edoc

7 7 - 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 (if applicable).

Assessment of compliance: Not relevant

8 8 - 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

Academic staff has sufficient latvian language knowledge for implementing study courses, see annex : Confirmation_knowlefge of the state language.

9 9 - 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 (if applicable).

Assessment of compliance: Fully compliant

A statement of the higher education institution/ college on the respective foreign language skills of the teaching staff involved in the implementation of the study programme at least at B2 level according to the European Language Proficiency Assessment levels (level distribution is available on the website www.europass.lv, if the study programme or part thereof is implemented), see annex: Confirmation - knowledge of the foreign language.edoc

10 10 - The sample of the study agreement complies with the mandatory provisions to be included in the study agreement.

Assessment of compliance: Fully compliant

Study agreements include all necessary parts set in legislation. See the annex: Study agreements.

11 11 - The higher education institution / college has provided confirmation that students will be provided with opportunities to continue their education in another study programme or another higher education institution or college (agreement with another accredited higher education institution or college) if the implementation of the study programme is terminated.

Assessment of compliance: Fully compliant

RTU and VGTU agreement states that in case of termination of study programme it is each universities responsibility to provide students with the continuation of the study process and to acquire degree or to continue studies when the licence and the accreditation is obtained again. Annex: RBMI0 4.pielikums_Kopīgās studiju programmememas atbilstība augstskolu likumam + līgums and additional annex provided by study programme director: SKAIDROJUMS Inovatīva ceļu un tiltu inženierija.

12 12 - The higher education institution / college has provided confirmation that students are guaranteed compensation for losses if the study programme is not accredited or the study programme’s license is revoked due to the actions (actions or omissions) of the higher education institution or college and the student does not wish to continue studies in another study programme.

Assessment of compliance: Fully compliant

RTU confirms that they will compensate losses for students in case of termination of the study programme. See annex: Confirmation on compensation for losses

13 13 - The joint study programmes comply with the requirements prescribed in Section 55.(1), Paragraphs one, two, and seven of the Law on Higher Education Institutions (if applicable)

Assessment of compliance: Partially compliant

Diploma supplement that is issued does not comply with Cabinet of ministers No. 202. It does not indicate what agreement is set between RTU and Vilnius Technical university.

14 14 - Compliance with the requirements specified in other regulatory enactments that apply to the study programme being assessed (if applicable)

Assessment of compliance: Not relevant

Assessment of the requirement [8]

1 R8 - Compliance of the study programme with the requirements set forth in the Law on Higher Education Institutions and other regulatory enactments.

Assessment of compliance: Partially compliant

Not all criteria are fully met. Diploma supplement should be updated in accordance with Cabinet of ministers 202.

General conclusions about the study programme, indicating the most important strengths and weaknesses of the study programme

It is concluded that the joint academic master study programme “Innovative Road and Bridge Engineering (45582)” mostly meets the requirements. The shortcomings presented in this report are ones which RTU may wish to address in the spirit of further enhancing the student experience by building on progress to date.
Currently the programme is a full-time study programme with a duration of 1 year 6 month and is held only in English language, implemented at Riga Technical University (RTU) and Vilnius Gediminas Technical University (VGTU).
The objective of the joint academic master study programme is to provide additional research skills to graduates of relevant professional bachelor's programmes and to provide an opportunity for international experience in their graduate studies, which is being met. The academic staff and students of the programme regularly publish research findings and present their work at research conferences.
The learning outcomes have been improved since the previous accreditation and set out the knowledge, skills and competences to be achieved. Nevertheless, the phraseology could be improved to reflect the higher order of learning expected of the students as they progress through the stages of the programme.
The programme does not include internships.
The final thesis comprises a research paper on a topical issue in the field. The quality of the final works has been judged to be of a very high standard, including the proportion of the grade coming from the examination committee which includes employer representatives.
The funding available to the study programme, funding sources and the use of funding ensures full implementation of the study process. However there is always space for improvement if further funding is provided. One of the priorities would be extra funding for equipment acquisition and regular calibration.
There are 2 asoc. professors or professors involved in study programme implementation all together from RTU side, that partially complies with the requirements.

Strengths:
1. Students and academic staff utilise and cooperate with the partner institution and bring the obtained experience back to the RTU.
2. Students are highly evaluated among employers and in high demand.
3. Good overall provision of resources, including the excellent library and access to academic

databases.
4. Collaboration with VGTU provides extended access to diverse equipment and resources.

Weaknesses:
1. The phraseology of learning outcomes does not reflect the incremental higher order of challenge to the students as they progress up through the stages of the programme.
2. Funding for equipment acquisition and regular calibration is too low.
3. Student enrolment numbers are low. Study programme sustainability regarding number of enrolled students.
4. The way of presenting the information that is important for proper and overall assessment of working in certain segments of study programme.(age structure).
5. Low level of involvement of external stakeholders (graduates, employers) in regular surveys.

Evaluation of the study programme "Innovative road and bridge engineering"

Evaluation of the study programme:

Good

2.6. Recommendations for the Study Programme "Innovative road and bridge engineering"

Short-term recommendations

Presentation and analysis of all relevant data for assessment of processes in the Institution (age structure of the academic staff).
Increasing the level of external stakeholders, (employers, graduates), involvement in regular surveys throughout explanation of the importance of the surveys and proving that their opinion makes difference and is taken into consideration when the programme is reviewed.

Long-term recommendations

Mechanisms are needed to attract more students to the programme
Study content needs to add focus to improving students' soft skills
Funding for equipment acquisition and regular calibration needs to be increased, and a regular schedule for equipment calibration needs to be implemented

II - "Architecture" ASSESSMENT

II - "Architecture" ASSESSMENT

2.1. Indicators Describing the Study Programme

Analysis

2.1.1. Professional Master level study programme Architecture (47581) is a full time study programme with a total length of 2 years and can be held in Latvian and English languages. Professional Master level programmes Architecture name and contents fits in and complies with study field Architecture and Construction.

2.1.2. Total amount of CP in the Professional Master level study programme Architecture (47581) is 80 CP which equals 120 ECTS. Study programme complies with the State Education standard set in rules of Cabinet of Ministers No. 512. Admission requirements are bachelor degree in architecture and urban planning, or other comparable education and level of English language proficiency at least B2 for English version of studies. These admission requirements are reasonable and provide continuity of the Architecture study programme from Bachelor to Master level studies. Degree awarded is - Professional Master Degree in Engineering Science of Architecture, qualification obtained - Architect. Study programme aims to provide all necessary practical skills and in depth theoretical knowledge to work under supervision of a certified Architect or provide a basis for continuing studies in doctoral level. Study programmes main tasks are to provide in depth theoretical and practical knowledge of complex design projects and deepen comprehension of architects role in the society. The study programme, aims, objectives, learning outcomes and admission requirements are interrelated and can be achieved in time of study programme implementation. Since Architects, Architect offices are also working in teams with specialists from abroad, not only locally in Latvia study programme implementation in English is reasonable to attract foreign Architecture students. Unfortunately RTU has not enrolled any students in this study programme type. This study programme should be advertised more internationally if not then RTU should consider closing this type of study implementation in English.

2.1.3. In the previous accreditation period the study programme underwent small changes: Study courses “Electrical systems in architecture” 2 CP and “Reinforced concrete and walls” 4CP were moved from the study programme to the Bachelor study programme. To help students with the final diploma project study course “Structural systems” was supplemented in last semester, also CP for internship were distributed more evenly and CP for final thesis were rearranged so students have more time for developing the thesis. Changes made in the study programme were meaningful and helped to improve the study process.

2.1.4. RTU claims that study programme implementation is based on industry surveys which are carried out by the Ministry of Economics. 90% of graduates after graduation are working in the industry. (SAR 3.1.3) This indicates that qualified Architects are demanded in the labour market and employers during the interviews confirmed that. In the previous period there were no English students enrolled in study programme. If RTU want to keep the study programme in English they should attract and enroll students. All Latvian students each year have taken state founded places ~35 out of 40. There have not been students paying tuition fees in the last accreditation period. (SAR 3.1.4.) Student enrollment statistics are stable and show no decrease in previous accreditation period. (Annex:Annex_5_Arch_RAGA_Statistics_EN).

2.1.5. N/A

Conclusions on this set of criteria, by specifying strengths and weaknesses

Study programme complies with necessary state legislation. Study programme name, degree, qualification awarded are also interrelated. Study programme, aims, objectives, learning outcomes and admission requirements compliments each other and complies within the study field. Graduates of this programme are demanded and in most cases are working in the industry after graduation. Student count has not significantly changed since previous accreditation. Unfortunately no students have chosen an English study programme, this might be an indicator for poor advertising of the study programme.

Strengths:

1. Students are interested in the study programme, each year all state funded places are taken and there are no indicators that students may stop applying for the study programme.

Weaknesses:
1. During the previous accreditation period there have not been enrolled students in the English programme.

2.2. The Content of Studies and Implementation Thereof

Analysis

2.2.1. The content of the professional master programme Architecture (47581) is topical and generally related to the discourse in the field. This is ensured by a curriculum (Professional Master programme “Architecture”, appendix 3.2) that covers the requirements set in binding provisions. According to SAR p.103 as well as the meetings with the academic staff and the director of the programme confirmed that the revision of study content takes place regularly (on an annual basis) and is held alongside the final thesis sessions. Furthermore, the revision of specific study courses, learning outcomes and study aims are discussed every semester among the academic staff to ensure their continued relevance to the field, and feedback from students is taken into account.

The programme is offered full time, and taught either in English or Latvian. The curriculum consists of a total 120 ECTS, including compulsory courses and electives. Two further components are internship and master thesis (Professional Master programme “Architecture”, appendix 3.2). Thematically, the content of study courses is interconnected and complementary to each other, allowing a degree of further specialisation in topics such as historic preservation, interior architecture, or architecture morphology. At the same time, it must be noted that elective courses do not fully represent the multiple professional roles of architect in the labour market and its expanded field (scientific, cultural, artistic), they lack broader exposure to humanities and digital thinking.

Both according to the experts’ meeting with the employers, as well as upon the evaluation of additional material (additional documents provided by HEI upon experts’ request, items #9 and #10) indicate that the content of the Master of Architecture studies meets the needs of the industry, labour market, and scientific trends. The thesis projects are professionally executed and respond to well defined and relevant topics. The expert group noted the study programme ensures a robust set of skills and knowledge to make both the students and graduates competitive in the industry; and they are in demand in part time positions in the industry alongside the studies.

2.2.2. The awarded degree is based on achievements and findings in the field and is based on Master Thesis, and the award of professional qualification is based on reviewed diploma examination. The topic of the thesis is related to the latest developments and topics in the field. (SAR, p.104)

2.2.3. The study programme combines theoretical and practical skills and multiple learning formats. The expert group observed that student centred learning is implemented and is based on dialogue between the students and the staff. During the meetings with the director of the study programme, the academic staff, students and graduates, the expert group repeatedly noted the close communication between all the involved parties, and mechanisms of mutual feedback and continuous improvement (SAR, p.104-105).

The experts noted study descriptions for courses are presented in both Latvian and English, and all

the academic staff and students demonstrated a good command of English. At the same time, the lack of international staff and students makes the culture of the programme unattractive for foreign students. According to Study field Annex, 2.5., and the Study Programme Annex #5, there were no foreign students enrolled in the Professional master of Architecture. This puts the question on the need for maintaining the English language stream of the programme, as well as its competitiveness with other professional Master study programmes in Latvia and abroad.

2.2.4. The internship component of the curriculum is well matched with the needs of the labour market and study objective. As noted by experts during the meeting with students and graduates, internship opportunities are regularly communicated to the students. The internship process is supervised by academic staff and a representative of a company, and needs to be presented in public as part of the evaluation (SAR, p.106). It is important to highlight that the programme allows the possibility for students to choose an internship outside Latvia, where the working language is other than Latvian.

It was indicated during the meetings with the academic staff and the director of the programme, the vast majority of students continue to work at the place of their internship after graduation. During the meeting with students and graduates, it was noted that there is a high proportion of students who work in architecture practice alongside their full studies. It is seen positively that the teaching staff accommodates for this. However, it also creates a conflict between the purpose of full time studies and the internship as a separate academic module, which in fact often becomes a fully parallel activity to the studies beyond its designated time in the study plan.

2.2.5. N/A

2.2.6. According to SAR, p.107-108, the thesis topics are relevant to the field, and in some instances can be based on the implementation of built work. Furthermore, the topics of the student thesis can be closely intertwined with the needs of local municipalities and thus the Latvian economy. As indicated by the academic staff in the meeting with the experts, these collaborations with municipalities are designed to ensure the introduction of new ideas and perspectives from the academic setting.

Conclusions on this set of criteria, by specifying strengths and weaknesses

Overall the content of the study programme meets all the relevant regulations, and especially the needs of the industry; it is well composed and allows the students to meet the study objectives and to be much demanded in the labour market. At the same time, the study content does not fully represent the multiple professional roles of architect in the labour market. This is especially noticeable in terms of architecture's expanded field (scientific, cultural, artistic) where architects play a professional role. Furthermore, the study content, while being diverse, does not offer exposure to both humanities and digital thinking—two fields that are adjacent but critical to todays' architecture education.

Strengths:
1. The programme offers conditions to develop a broad range of relevant masters thesis
2. Possible collaborations with local municipalities ensure the relevance and social benefit of thesis projects
3. The principle of elective courses has the potential to allow development of specific interests within the field

Weaknesses:
1. The possibility of specialisation via elective courses is narrow and does not fully represent the multiple professional roles of architect in labour market
2. Students work unspecified hours alongside full time studies, and often this employment grows into the internship, undermining the time allocation for studies.
3. The study programme is available in English and to foreign students, but there are no students enrolled in it
4. The existing elective courses severely lack flexibility when it comes to learning about humanities and fundamentals of digital thinking.

Assessment of the requirement [5] (applicable only to master's or doctoral study programmes)

1 R5 - The study programme for obtaining a master's or doctoral degree is based on the achievements and findings of the respective field of science or field of artistic creation.

Assessment of compliance: Fully compliant

Despite the shortcomings, in principle the study contents correspond with the relevant findings of the scientific and artistic field. This is indicated in SAR, p.107-108 Documents provided by HEI upon experts' request, items #9 and #10.

2.3. Resources and Provision of the Study Programme

Analysis

2.3.1. The study provision, both informative and material, technical, are compliant for the study programme Architecture (47581). Informative resources are available from RTU Scientific Library, online databases, e-books, e-journals, Faculty of Architecture also has its own library and resource room (SAR p. 109). As for the material and technical provision, during the tour of facilities expert group was impressed by the well equipped workshop rooms for wood and carpentry, as well as scale modeling workshop. Each student is given 24/7 access to a workplace in the design workshop.

2.3.2. N/A

2.3.3. The funding available to the study programme, funding sources and the use of funding ensures full implementation of the study process. However there is always space for improvement. For example as mentioned in the site visit meetings with the director of the study programme funding to attract guest lectures would be helpful. The funding and the cost per student has been increasing in the period of the study year 2017/2018 to 2020/2021 (SAR p. 110). According to the annex to SAR Funding distribution between the cost items the major part (45%) is used for remuneration, leaving for example the position of purchase and modernization of equipment with less than 1%. It leaves a question - is such distribution sustainable in the long term as such a great part is allocated for first necessities? The study programme has the minimum number of students to ensure the profitability of the study programme. According to the annex to SAR On minimal number of students in study programmes there must be at least 19 students in first level, bachelor's level (including second level professional study programmes) – which is met (each year there are 40 students enrolled in study programme in the Latvian language programme).

Conclusions on this set of criteria, by specifying strengths and weaknesses

Overall resources and provision of the study programme are compliant for the study programme. There is a decent provision of informative resources, a specialized library for the needs of the study

field. Good material and technical provision, well equipped workshop rooms. Access to both informative and technical resources is ensured convenient. At the same time, it is evident that the study programme would benefit from higher funding or distribution of funding providing a greater percentage for positions to attract guest lecturers.

Strengths:
1. Provision of informative materials, availability of library resources.
2. Well equipped workshop rooms.
3. 24/7 access to a workplace in the design workshop.

Weaknesses:
1. The funding available to the study programme, the distribution of it.

Assessment of the requirement [6]

1 R6 - Compliance of the study provision, science provision (if applicable), informative provision (including library), material and technical provision and financial provision with the conditions for the implementation of the study programme and ensuring the achievement of learning outcomes

Assessment of compliance: Fully compliant

SAR p. 109-110. The study programme has all the necessary provisions for the implementation of the learning outcomes.

2.4. Teaching Staff

Analysis

2.4.1. The qualification of staff enables the achievement of learning outcomes and meets all the relevant study requirements and regulations of the professional master programme Architecture (47581). The programme is implemented by over 20 members of the academic staff. This includes 14 doctors of science, and 7 elected professors are taking part in the study program implementation, including 3 professors from the Faculty of Architecture (SAR, p.111 and p.115). Furthermore, according to SAR p.111 and the information obtained during the meeting with the director of the study programme, the academic staff is generally split into two categories: full time academic staff (including 14 staff members qualified as Doctor of Science) and part time professors and lecturers who work in the industry, and this insures both high quality research output as well as an ongoing connection to the developments in the professional field. Qualified staff members are attracted from the industry, as well as hiring existing PhD students.

The SAR indicates that there are visiting lecturers of a total 75 from 22 countries who have taken part in the implementation of the study programme (p.114). However, the experts discovered that the vast majority of incoming staff mobility is short-term. Attracting international staff currently is only implemented via a EU-funded and time-limited SAM project (set to expire in 31.11.2022), and has resulted in only one international staff member being attracted to teach in the study programme. Furthermore, the study programme seems to lack connections to international networks of academics to attract foreign staff beyond Latvian architects with work teaching experience abroad, as evident in the list of foreign teaching staff on SAR p.62. The meeting with the director of the programme confirmed the success of attracting the single foreign staff member, but also outlined the difficulties in terms of more structural, long term implementation of foreign staff due to lack of resources.

2.4.2. Renewal of the academic staff is identified as one of the main tasks, and is being addressed according to the interview of the director of the study programme and SAR p.115. In general the teaching staff numbers remain stable—over the last reporting period 4 new teaching staff have joined the program, and according to SAR p.115 and the conversations with the head of the programme, their research expertise has been successfully integrated in the study programme. The institution ensures that changes in composition of teaching staff do not negatively affect the quality of the implementation of the study programme. Teaching assignments are organised in accordance to staff members' individual teaching loads and expertise. It must be noted that during the meeting with the academic staff, the experts noted a high degree of enthusiasm and motivation among the staff members.

2.4.3. Not applicable.

2.4.4.The academic staff are continuously involved in producing research outputs (over 40 articles per year according to SAR p.116) and artistic achievements (Study Field appendixes 2.3 and 2.4, as well as SAR p.117-119). Their research topics are integrated with the formulation of study content and the topics of thesis (SAR, p.116-117).

2.4.5. According to experts' meetings with both the director of the study programme and the academic staff, a mechanism for mutual cooperation is established among the staff both on systemic level and by providing spaces for informal communication. On the most fundamental level it is articulated via regular staff meetings and coordination of study content and necessary revisions. Study content is organised in thematic blocks that are coordinated to avoid overlaps between them. Furthermore cooperation mechanisms are based on balanced teaching loads of academic staff (SAR, p.120)

Conclusions on this set of criteria, by indicating strengths and weaknesses

Overall the staff of the programme is fully qualified in regard to the applicable requirements. The experts noted a high degree of motivation and interest in the study programme. At the same time renewal of the academic is crucial to the long term sustainability of the programme, and further efforts need to be invested in this matter. Short term staff mobility seems prevailent, however due to limited resources, long-term staff mobility both inwards and outwards remains a challenge, and the efforts by the study programme to attract international staff is challenging.

Strengths:
1. The study programme has motivated academic staff for meeting the learning outcomes

Weaknesses:
1. The study programme lacks a sustainable strategy and concrete mechanisms for attracting and involving international staff to the program in the long term, beyond one-off EU-funded programs.

Assessment of the requirement [7]

1 R7 - Compliance of the qualification of the academic staff and visiting professors, visiting associate professors, visiting docents, visiting lecturers and visiting assistants with the conditions for the implementation of the study programme and the requirements set out in the respective regulatory enactments.

Assessment of compliance: Fully compliant

Study Field appendixes 2.3 and 2.4, SAR p.117-119.

2.5. Assessment of the Compliance

Requirements

1 1 - The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard

Assessment of compliance: Fully compliant

Study programme Architecture (47581) complies with the Professional Higher Education Standard (Cabinet of Ministers No 512.) Study programme length is 2 years (80CP), consisting of 22 CP in compulsory part, 6 CP in elective compulsory part, 26 CP in traineeship and 26 CP in defence work with integrated diploma project. Annex 6. pielikums_Mg_Arch_LV shows overall compliance, CP amount was evaluated based on annex:10. pielikums_Mg_Arhi_planojumus_LV.

2 2 - The study programme complies with a valid professional standard or the requirements for the professional qualification (if there is no professional standard required for the relevant occupation) provided if the completion of the study programme leads to a professional qualification (if applicable)

Assessment of compliance: Fully compliant

Qualification standard currently is in the process of approval. RTU has evaluated study programme compliance with the last available standard version. Study programme syllabus and traineeship are organised in a manner that students can meet all requirements set in the standard. See annex: 7.pielikums_Arh_Mag_prof_standarts_LV

3 3 - 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 561 , Paragraph two and Section 562 , Paragraph two of the Law on Higher Education Institutions.

Assessment of compliance: Partially compliant

Study course descriptions are well prepared and they contain all basic knowledge on the length, syllabus, learning outcomes, and evaluation methods in the study course. Since the programme is held also in English, course descriptions are available also in English. Nevertheless, compulsory literature should be revised and updated, because most of the literature is from 2000s'and some materials are older than 20 years. To create even better study course descriptions in the future RTU can consider adding a table which includes on what lecture, lesson what type of knowledge check will be held, and add more detailed descriptions on what will be learned in each lecture, lesson. See annex: RAGA_LV.

4 4 - The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure according to which state recognised documents of higher education are issued.

Assessment of compliance: Fully compliant

Diploma issued complies with the state legislation. See annex Arch_Mg_dipl_LV.

5 5 - 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 Higher Education Institutions.

Assessment of compliance: Not relevant

Not applicable

6 6 - 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 Higher Education Institutions.

Assessment of compliance: Not relevant

Not applicable

7 7 - 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 (if applicable).

Assessment of compliance: Not relevant

Not applicable

8 8 - 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

Academic staff has sufficient latvian language knowledge for implementing study courses, see annex : Apliecinājums - valsts valodas prasme.

9 9 - 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 (if applicable).

Assessment of compliance: Fully compliant

Academic staff has sufficient English language knowledge for implementing study courses. Confirmation available in annex: Apliecinājums - svešvalodu prasme.

10 10 - The sample of the study agreement complies with the mandatory provisions to be included in the study agreement.

Assessment of compliance: Fully compliant

Study agreements include all necessary parts set in legislation. See the annex: Studiju līgumi.

11 11 - The higher education institution / college has provided confirmation that students will be provided with opportunities to continue their education in another study programme or another higher education institution or college (agreement with another accredited higher education institution or college) if the implementation of the study programme is terminated.

Assessment of compliance: Fully compliant

The RTU has an agreement with LLU (Latvia University of Life Sciences and Technologies) that in case the study programme will be terminated students will be provided with the option to continue studies in LLU. See file VienosanÉs_LLU un RTU_Arhitektura_buvnieciba. RTU in future should provide information about exactly which study programme students can continue their studies. This information also would be beneficial for the students.

12 12 - The higher education institution / college has provided confirmation that students are guaranteed compensation for losses if the study programme is not accredited or the study programme's license is revoked due to the actions (actions or omissions) of the higher education institution or college and the student does not wish to continue studies in another study programme.

Assessment of compliance: Fully compliant

RTU confirms that they will compensate losses for students in case of termination of the study programme. See annex: Apliecinājums - par zaudējumu kompensāciju.

13 13 - The joint study programmes comply with the requirements prescribed in Section 55.(1), Paragraphs one, two, and seven of the Law on Higher Education Institutions (if applicable)

Assessment of compliance: Not relevant

Not applicable

14 14 - Compliance with the requirements specified in other regulatory enactments that apply to the study programme being assessed (if applicable)

Assessment of compliance: Fully compliant

RTU have indicated that this study programme complies with construction law. See annex: Atbilstība specifiskajam normatīvajam regulējumam. Latvian Architect certification union centre also provided their opinion about Architecture study programmes in letter Nr. 041/2022 at 14th of March 2022. RTU should take into account suggestions provided by the union but overall study programme was evaluated as good.

Assessment of the requirement [8]

1 R8 - Compliance of the study programme with the requirements set forth in the Law on Higher Education Institutions and other regulatory enactments.

Assessment of compliance: Fully compliant

The programme is compliant with the requirements set forth in the Law on Higher Education Institutions and other regulatory enactments

General conclusions about the study programme, indicating the most important strengths and weaknesses of the study programme

Professional Master level study programme Architecture (47581) is a full time study programme held in Latvian and English languages. Unfortunately for the previous reporting period no English-speaking groups have been formed so RTU should either close this form of programme or advertise and attract foreign students to the English programme, bringing more international environment into the faculty. Study programme provides deeper knowledge of Architects role in society and with the help of internships helps to develop student skill set, so they could enter the labor market as certified specialists. Study programme complies with necessary state legislation. Main tasks of the programme are to provide in depth theoretical and practical knowledge of complex design projects. Collaborations with local municipalities ensure the relevance and social benefit of student thesis projects. At the same time elective study course options are limited and does not fully represent the multiple professional roles of architect in labour market. Students are closely related to the industry but that also limits students' general awareness on the role of the architect and the exploration of alternative modes of architecture practice during the studies at the same time the time spent at work potentially is undermining the study process quality. Students have accessibility to RTU

premises and laboratories 24/7. Regarding staff high degree of motivation and interest in the study programme was noticed. At the same time renewal of the academic is crucial to the long term sustainability of the programme, and further efforts need to be invested in this matter, unfortunately in this programme as well as in Bachelor level incoming mobility of academic staff is also very low.

Strengths:
1. All state funded places are taken and there are no indicators that students may stop applying for the study programme.
2. Collaboration with industry and municipalities provides opportunities to develop actually relevant master thesis works.
3. 24/7 access to a workplace in the design workshop.

Weaknesses:
1. During the reporting period no English speaking student groups have been enrolled.
2. Too strong connection with internship and working alongside studies may impair study quality.
3. Precise strategy to attract international personnel to bring forward international dimension in study process is lacking.

Evaluation of the study programme "Architecture"

Evaluation of the study programme:

Good

2.6. Recommendations for the Study Programme "Architecture"

Short-term recommendations

Since no students have been enrolled in the English flow of the programme, consider to either close it and focus more on mobility options, or to revise it and make it attractive for international students.

Long-term recommendations

The internationalisation and long term staff mobility should be substantially improved in order to avoid the risk of creating an insular intellectual culture.
The possibility of specialisation via elective courses should be broadened to represent the multiple professional roles of architect in labour market and the scientific and artistic field, and should include broader set of humanities subjects
Other formats of incorporating student part time employment and internship should be investigated in order to improve the actual learning outcomes of the programme (i.e. a part time masters programme integrated with employment in a practice)
Elective courses should provide more flexibility in both humanities subjects and fundamentals of digital thinking

II - "Geomatics" ASSESSMENT

II - "Geomatics" ASSESSMENT

2.1. Indicators Describing the Study Programme

Analysis

2.1.1. This Professional master study programme Geomatics (47581) is accredited in May 2017. The revisions mentioned below are made in order to harmonize this study program with the study field.

The programme has been developed in accordance with the Law on Higher Education Institutions of the Republic of Latvia, the Classification of Education of the Republic of Latvia and the Classification of Professions of the Republic of Latvia, with close cooperation with relevant Latvian professional associations. This way the compliance of the aims and objectives to the professional requirements of the professional organizations (and therefore the labour market) is assured. As stated in the SAR: "The acquisition of skills and knowledge envisaged in the study program is ensured by the European level academic and scientific staff (EU and Latvian experts in the field of technical sciences), who are involved in the provision of national and European level engineering solutions on a daily basis." (p.129).

The main goals of the revised program, among other things, are:(“ to provide students with a wide, professional, practically oriented education, which gives an opportunity to easily adapt to the labor market, as well as to carry out scientific research work; to provide students with theoretical and practical training corresponding to the fifth level of professional qualification, which gives an opportunity to obtain the qualification of a civil engineer, as well as to continue education in doctoral studies. . . “SAR,p. 123).

It is in compliance with the aim of the study field ”Architecture and Construction” (SAR,p.18) regarding education professionals whose skills and competencies meet the requirements of the national economy and society.

But, the professional master's study program "Geomatics" is unique in Latvia, with no analogous program in the European Union (EU) education area, only a small number of similar programs. It is difficult to make parallels with different programmes in order an objective assessment to be reached, speaking of the programme quality and its study subjects' contents. Only full-time studies are possible.

2.1.2.After passing the theoretical subjects, completing the practice tasks and defending the master's thesis in the State Examination Commission, the professional master's degree in geomatics with the qualification of a civil engineer is awarded. The qualification is “Civil Engineer”, (for full time studies in duration of 2 years and six months), while there is no qualification for full time studies - 1 year and 6 months.

Based on the SAR, p.129, Programme code 47581 complies with Cabinet of Ministers Regulation No 322 Latvian Classification of Education. The first and second levels of classification, represented by the first two digits of code 47, Second-level professional higher education (professional master's degree or level 5 professional qualification), awarded after obtaining a bachelor's degree, professional bachelor's degree or level 5 professional qualification. The third, fourth and fifth levels of classification (thematic groups, subject areas and programme groups), denoted by the next three digits 581, are Civil Engineering (58 stands for Architecture and Civil Engineering"), the code demonstrates the correlation of the study programme to the national regulations.

Innovative technologies are introduced in the implementation of the study program and, as written, the focus is directed toward their comprehensive assessment for sustainable economic

development.

The results of students' knowledge assessment are regularly discussed (twice a year) at the meetings of the Council of the Institute of Transport Structures and are compiled and evaluated by the program administration. These results, further on, serve as a basis for improvement of the study process. Also, the commission for the defence of final theses opinion on the quality of master's theses and their defence is used for the same purposes.

Furthermore, the learning outcomes are reviewed periodically (once a year) for the purpose of improving the content of the study courses and correlating them with the industry innovations. Student semester surveys and graduate surveys are held. Employers participate as involved parties in the implementation of the study programme (meetings with students, graduates, employers, 16th of February, 2022). All of this mentioned before makes a good quality system.

Speaking of admission requirement, RTU has procedures developed for the recognition of previous non-formal education or professional experience.

2.1.3. The Senate in September, 2021 initiated several changes to the admission requirements and professional qualification to be obtained, which confirms the dynamic character of this ambitious unique programme, but at the same time ensuring better study programme features (change the admission requirements for the first implementation option from 'professional bachelor's degree in geomatics, construction, transport or heat, gas and water technology, or qualification of an engineer in geodesy and cartography' to 'professional bachelor's degree in geomatics or equivalent education'; change the professional qualification to be obtained for the second implementation option from "geodesy and cartography engineer" to "civil engineer"; change the admission requirements for the second option from 'professional bachelor's degree in geomatics, construction, transport or heat, gas and water technology, or qualification of an engineer in geodesy and cartography' to 'bachelor's degree of engineering in geodesy, cartography, geomatics, geography, land survey, forestry or geology, or equivalent education').

The improvements of the study programme in the previous period caused the Internship beyond the educational establishment to be an integral part of professional programme, the description of study courses to include the aim, the tasks and the learning outcomes, the supervision of academic staff in the course of studies to be implemented in the form of tutorials, the content of internship to be developed by incorporating the learning outcomes that are relevant to the specific nature of the sector, a summative assessment to be used, 20% of study programmes to be implemented in English.

It is to be noted that students, academic staff, graduates and employers representing stakeholders are involved in the development of the self-assessment report of the study programme.

2.1.4.Undoubtedly, the labour market is in a great demand for highly-qualified geoeducated staff (as proved by the EuroGeographics Association, the Board of Surveyors, The Council of European Geodetic Surveyors (CLGE) and Geometer Europas (GE) study). The professional master's study programme "Geomatics'' seems to educate this kind of professionals who are able to collect, process, analyse, and present spatial data and to apply innovative technologies and data processing techniques and perform even more specific and demanding skills that are highly valued and in shortage in the labour market.

The dynamics of the number of students is as follows: There has been an increase in the number of

enrolled students in 2015/2016, (12 students or 30%), compared to previous academic year. The same situation is observed in the next academic year, (20%), while the decreasing of students' number, (by 28%), is characteristic for 2017/2018. In 2019/2020, compared to 2018/2019, a growth of 7% was observed. Because of the pandemic, in 2020/2021, the number of students decreased by 10%.(SAR,p.132).

Since there is a very noticeable gap between labour market demand and supply of specialists and institutions of higher education study programs, the employability rate of the graduates is expected to be near 100%. The graduates proceed their professional careers in Lithuania, Latvia and other EU member states being employed in multidisciplinary companies and organisations involved in the supply of consulting, planning and design services or different kinds of surveying or GIS applications or to be employed by Latvian governmental institution established in to implement land reform or other governmental institution of similar type.

Another option or a parallel option to working position is a continuation to doctoral (PhD) studies.

2.1.5. N/A

Conclusions on this set of criteria, by specifying strengths and weaknesses

This type of the study program ("Professional master study programme") has been revised on the base of the national legal acts (Law on Higher Education Institutions of the Republic of Latvia, the Classification of Education of the Republic of Latvia, the Classification of Professions of the Republic of Latvia) and labour market requirements (relevant Latvian professional associations). In addition, the aims and objectives of the study field and this study program are ensured by the European level academic and scientific staff. What makes this program special is that it is unique in Latvia, with no analogous program in the European Union (EU) education area.

The analysis of the documents relevant to this study program leads to the conclusion, that the education classification code (47581), the type of the program (Professional master study program), degree to be obtained (Professional Master Degree in Geomatics), professional qualifications of graduates are supported by the national legal acts and University regulations.

The duration of the studies (1 year, 6 months, and 2 years, 6 months), full time studies for Professional Master Degree in Geomatics), their scope and admission requirements (professional bachelor degree in geomatics or comparable education/bachelor's degree in engineering in geodesy, geomatics, geography, land management, forestry or geology, or an equivalent education) depends on the study type. The recognition of previous non-formal education or professional experience is carried out according to precisely established procedures. The implemented language is Latvian.

Intended learning outcomes are in line with the aim and tasks of the program. They are reviewed periodically on the study program level (improving of the study courses), discussed (twice a year) on the level of the Council of the Institute of Transport Structures. The commission for the defence of final thesis is also involved in improvement of this area of study program implementation. As can be seen, all the mentioned parameters of the study program are interrelated.

The improvements of the study program (upgrading the study course description, supervision in the form of tutorials, incorporation of the learning outcomes in the frame of internship, implementation of 20% of study programs in English) are put in place.

Bearing in mind the labour market, as well as the opinion of professional bodies and associations, there is a high demand for professionals in this field, not only in Latvia, but also in other EU countries. Therefore, the employability rate of the graduates is expected to be near 100%. Additionally, they can continue their education on doctoral studies.

On the other hand, the number of enrolled students calls into question the sustainability of this study programme. There are several reasons that lead to this situation, (not enough students on Bachelor study programme, demographic changes, number of state budget seats which have not increased in the last 6 years).

Strengths:
1. This study program is unique in Latvia.

Weaknesses:
1. The program sustainability regarding the number of students enrolled.

2.2. The Content of Studies and Implementation Thereof

Analysis

2.2.1. The content of the professional master programme Geomatics (47581) is topical and generally related to the discourse in the field. This is ensured by cooperation with professional and international associations. Furthermore, this is ensured by a curriculum (professional master programme “Geomatics”, appendix 3.2) that covers the requirements set in binding provisions. The meetings with the academic staff and the director of the program confirmed that the revision of study content takes place annually. Furthermore, the study programme administration coordinates the contents of the program with professional associations, which ensures a close coronation of the study content and the broader field (SAR, p.134-135).

According to SAR p.126, the programme is available in two forms of full time study (1 year 6 months) and (2 years 6 months). The difference between full and part time programs translates in the difference between 60 and 100 credit points (SAR, p.126), and is intended to match the prior experience and professional qualifications of students. Students without a prior professional qualification are provided with additional internships in the field. The curriculum includes compulsory and optional courses, as well as practice (for the purposes of this report, understood as internship). Thematically, the content of study courses is interconnected and complementary to each other. This curriculum is supplemented by regular guest lectures, seminars, and conferences that take place at HEI (SAR, p.135).

Programme’s compliance with relevant regulations and standards is assured at SAR, p.129 and p.141, and the programme is considered unique in Latvia. Furthermore, there are only a few similar programmes in the European context which is said to indicate its competitiveness in the overall offering of higher education. At the same time, during experts’ meetings with the students, graduates, and representatives of the program it was noted that the dropout rate is relatively high.

2.2.2. The awarded degree is based on achievements and findings in the field and is based on the final examination of the master thesis, and the award of professional qualification is based on it. The topic of the thesis is related to the latest developments and topics in the field, and is related to relevant challenges in geodesy, cartography, or land management (SAR, p.150-151).

2.2.3. The expert group observed that student centred learning is implemented. According to SAR,

p.142, the learning in the programme is based on dialogue and active involvement of students in the improvement of the study process. Furthermore, the didactic concept of the programme is “based on the use of the latest and most advanced teaching methods,” which includes group work, field trips, seminars, and others. This was confirmed by the students and graduates who indicated close communication between all the involved parties, and the existence of mechanisms of mutual feedback and continuous improvement. SAR p.143 indicates field trips to industry enterprises as one of the pedagogical approaches, and meetings with students confirmed that there is a space for improvement of having more frequent field trips.

2.2.4. Internships are organized in relation to the study goals and are an integral part of the curriculum. The professional master programme has two pathways for the internship: for the students without prior engineering qualification the internship amounts to 32 credit points, and the for the students with engineering qualification, it amounts to 6 credit points (SAR, p.148) In both cases, the objective of the internship is to ensure the combination of theoretical knowledge and practical experience. Students’ search for available openings is supported both by Career Support and Services Department (SER, p.149), as well as informal assistance by the teaching staff. The internship is finalized by a public presentation and the prior writing of an internship report during the internship.

2.2.5. N/A

2.2.6. The final thesis consists of the final master thesis that explores relevant challenges of the scientific field, and outlined in SAR p.151. The relevance of the thesis is ensured by a public presentation to the examination commission which includes industry representatives. According to the information obtained during the experts’ meeting with the graduates and employers, the thesis topics are relevant to the professional field.

Conclusions on this set of criteria, by specifying strengths and weaknesses

Overall the content of the study programme meets all the relevant regulations, it is designed to cater to students both with and without prior professional qualification. According to analysis, the curriculum of the programme is well composed and allows the students to meet the study objectives and to be much demanded in the labour market. The revision of study content takes place annually.The master thesis is developed in accordance with the up-to-date discourse in the field, and an internship ensures a strong connection to the industry and the labor market.

Strengths:
1. Programme is tailored for professionally both qualified and unqualified students
2. A broad range of teaching methods is employed to meet study goals
3. The contents of the study programme are coordinated with professional associations

Weaknesses:
1. Student exposure to the industry via field trips and other forms of engagement is lacking besides the internship

Assessment of the requirement [5] (applicable only to master's or doctoral study programmes)

1 R5 - The study programme for obtaining a master's or doctoral degree is based on the achievements and findings of the respective field of science or field of artistic creation.

Assessment of compliance: Fully compliant

The academic staff and students of the programme publish research findings and present their work at research conferences. The awarding of the degree takes account of the student's contribution to advancing the art and science of engineering as evidenced in their final thesis. This is confirmed by SAR, p. 150-151, Annex 3.2 and additional documents provided by HEI upon experts' request, item #10

2.3. Resources and Provision of the Study Programme

Analysis

2.3.1. Study programme Geomatics (47581) is supported by the Department of Geomatics, which is a part of the Faculty of Civil Engineering. Since this is a professional study programme, a large amount of lessons are focused on training student skills in different situations regarding geodesy, surveying, leveling, calculations etc. Students have access to a geodetic survey tool laboratory, which provides students with an abundance of different tools such as - Leveling instruments, tachymeters, laser scanners, gravimeter, drones with different cameras and sizes, GNSS receivers etc. All this equipment was demonstrated and shown during the site visit. Students confirmed that if they need they have the access for this equipment to complete research works, complete assignments and utilise them during field trips. Available equipment is with different levels of sufficiency. In this study level students are using more sophisticated and precise tools that are usually electronically controlled. Obtained data can also be transferred to a 3D environment, and as an example a geodesy laboratory showed 3D scanned and re-created Cēsu city castle, this equipment have been also used to measure and scan Rigas hydro electrostation dam. Most of the instruments are dominated by the Leica company but a big opponent for delivering technologies is also Trimble technologies. To analyse and work with data students have access to special software licences, such as - ArcGIS Pro, Leica Infinity, Bentley Microstation. All learned skills are relevant to the industry and most of the students are working in the industry during their studies. Regarding laboratories, lecture halls, they are sufficient for the student amount and can provide students with a necessary study environment. Students have access to the premises of the whole faculty. See SAR 3.3.1. p.154. Regarding informational base and support for the study process each year the library purchases new books which include the latest developments of the industry and students can lend the books from the library. Besides that RTU have huge library with paper books and e-resources including database subscriptions such as Scopus, Web of Science, ProQuest Ebook central etc., which can be accessed or ordered on site or through ORTUS platform. Library premises also have been renewed and since the repairs more students have been attending the library. All the most important information and communication is held through the ORTUS platform. ORTUS is an excellent platform for providing all necessary materials and tests for the students and is flexible to organise study work for the lecturers. ORTUS also includes anti-plagiarism tools such as Turnitin, which can check student works with available internet resources and databases. This tool is also used to evaluate plagiarism for the final thesis. All internal agreements, communication and inquiries etc. can also be organised and managed via the ORTUS system.

2.3.2. N/A

2.3.3.RTU has determined that for the successful implementation and profitability of the study programme each study year has to contain at least 19 students in second level professional study programmes annex: On_minimal_number_of_students_in_study_programmes. Based on this study programme student statistics annex: 5. pielikums each year there are less than 20 students enrolled so all of them who are in full time studies are in state founded places. For the full time study

programme there are 20 state funded places information obtained from RTU webpage : https://www.rtu.lv/lv/studijas/visas-studiju-programmememas/atvert/BGE?department=24000&type=A. The web page also indicates that tuition fee is only 2075 EUR which contradicts actual cost per student. RTU should raise the tuition fee for the part time study programme to be sustainable. Factual average cost per one student in this study programme is calculated 5025,27 EUR in 20/21 academic year annex: Studiju_programmememu_finansejuma_sadalijums. Nevertheless, RTU in SAR 3.3.3. p. 154 indicates that Financial resources of the study programme “Geomatics” are sufficient for the study programme implementation and their usage is controlled regularly both on the part of the administration, and on the part of the RTU Vice-Rector for Finance, that indicates inconsistency. Seems that student interest in the study programme has decreased, which may lead to problems for attracting potential master students as academic staff members to the study programme.

Conclusions on this set of criteria, by specifying strengths and weaknesses

Premises, tools, information resources provided to students provide possibility to develop scientific approach to geomatics and help to achieve study programme outcomes and develop deeper knowledge acquired from bachelor level studies.

Strengths:
1. Provides students with advanced technique and software for practical works and developing final thesis.

Weaknesses:
1. None indicated regarding infrastructure.

Assessment of the requirement [6]

1 R6 - Compliance of the study provision, science provision (if applicable), informative provision (including library), material and technical provision and financial provision with the conditions for the implementation of the study programme and ensuring the achievement of learning outcomes

Assessment of compliance: Fully compliant

Premises, tools, financial flow is calculated and sufficient for the implementation of the study programme. Available resources enables students to achieve learning outcomes and successfully prepare final thesis.

2.4. Teaching Staff

Analysis

2.4.1. The list of teachers involved in the realisation of this professional master study programme Geomatics (47581), as well as the development of professional careers are presented in SAR, p.162. Number of teachers and their positions are also provided in the Report (SAR, p.166).
In accordance with the content of the Table, it can be concluded that there is 1 professor (7,7%), 5 associate professors (38,5%), 1 assistant professor (7,7%), 4 lecturers (30,8%), 1 researcher (7,7%), 1 lab. staff (7,7%). 6 members of the staff hold doctoral degrees (46,2%), while the number of teachers with master's degrees is 7 (53,8%).

Bearing in mind that this is a professional study programme, the practical work experience of teachers is also very important. On the basis of the professional biographies analysis, (SAR, p. 162), it can be concluded that the members of teaching staff develop their professional competences

through engagement in professional associations, (Certification Centre of the Latvian Association of Surveyors, Latvian National Association of Geodesy and Geophysics, Latvian Astronomical Society, etc). They also participate in qualification upgrade events, (courses, seminars, conferences), and professional projects. Some of them work as experts and consultants in different companies, while there are instructors who work directly in geodesy and cartography, (crucial disciplines in geomatics).

SAR states that "…the study programme administration is interested in attracting academic staff from other universities". Consequently, the members of the expert group were interested if the Institution has a strategy on how to do this and what instruments are planned to be introduced in order academic staff from other universities come to teach at this study programme (meeting with directors of the study programme – 16th of February 2022).

The representative of the Institution said that they had guest lecturers from the UK in the previous years. Nordplus Programme is also utilised for attraction, as well as Erasmus mobility. In addition, he confirmed that there is a lack of PhD holders at Riga University, as the management team is aware of these issues, and it is obvious that there is a need for improvement.

Additionally, there is no data for the proportion of the number of the students and the teaching staff within the study programme. The total number of academic staff members involved in the implementation of the programme is 13 (as presented in the Report, p.166). In accordance with the content of the Report (p.132), the number of students in this programme for the 2020/2021 academic year decreased by 10% (major impact of the pandemic). Furthermore, the representative of the management team emphasises (meeting – 16th of February 2022), that there is a quite high drop-out rate in the frame of bachelor study programme (the main reason is found in the insufficient knowledge obtained during the secondary education). Therefore, due to the small number of students on the Bachelor programme, the number of students on the Master study programme is lower, too. In addition, plenty of ways of University support to the development of teachers' qualifications (as it was mentioned in the analysis of "Professional Bachelor Study Program", (code 42581), were emphasised for this master study programme, too.

2.4.2. The composition of the teaching staff is explained in detail in the previous chapter. It should be mentioned that the percentage of teachers with Doctoral degrees has not changed during the reporting period.(46,2%). Furthermore, it should be emphasised that there are lecturers(with significant practical experience - more than 20 years), who continue their education within Doctoral studies. When it comes to the age structure, it can be concluded that 46,2% of the total number of teachers are between 41 and 50. Currently, the percentage of staff holding a Doctoral degree who are above 60, decreased. (7,7%).

As can be witnessed, only 46.2% of academic staff members hold a Doctoral degree. As a possible solution for this issue, "the study programme administration attracts Doctoral students to participate in its implementation". At present, their number is 3, representing 23.1% of the total number of academic staff" (SAR, p.167).

2.4.3. N/A

2.4.4. This is Professional Master study Programme. The career development of teachers who participate in study programme delivery is presented in details on the page 162, SAR. It is the same structure of the teaching staff as for the programme in Geomatics (code 42581). Consequently, the following conclusion towards fulfilment of the criteria 2.4.4, can be presented: Teachers involved in

delivery of this study programme meet the requirements regarding publishing of papers in peer-reviewed editions (as well as international editions), they participate in different artistic events and have practical experience according to the Law on higher Education Institutions (Study Field appendixes 2.3 and 2.4, as well as SAR p.161-165).

2.4.5. The same mechanisms which were mentioned for “Professional Bachelor Study Programme” (code 42581), are applied in this master study programme (participation in professional training seminars, academic conference “Integration of Methodological and Scientific Work into the Study Process”).

Bearing in mind the goal of the programme (SAR,p.123), which is, among the other things, oriented “to provide students with a wide, professional, practically oriented education, which gives an opportunity to easily adapt to the labour market, and to carry out scientific research work”, its interdisciplinarity, cooperation with colleagues from other universities (discussed on the meetings on 16th of February, 2022), and members of academic staff from different organisational units in the frame of the University, is very important for successfully achievement of goals, tasks and results of the programme. The employers are also involved in these processes (it is mentioned in the assessment of the “Professional Bachelor Study Programme”). Furthermore, in addition to the regular students’ survey delivered as part of the University self-assessment processes, some teachers organise their own surveys related to the content of the study course, way of its delivering, assessment of student learning outcomes.

Conclusions on this set of criteria, by indicating strengths and weaknesses

The analysis of the SAR, especially when it comes to the characteristics of the academic staff (number, academic position, its composition as a whole), as well as the results of the discussions with various focus groups, points to the conclusion that 46.2% of academic staff members hold a Doctoral degree. This percentage is low, taking into account that this study programme is a master – postgraduate programme. There is only one academic member staff with the highest position – professor. The expert group opinion is that although the professional study programme is being discussed and the practical work experience is a very important part of it, the percentage lower than half of academic staff who hold a Doctoral degree is an issue. Still, the level of the programme is master, whether it is professional or academic one. This is not directly connected to the legal requirement for the actual number of teachers involved in delivering the programme, but only to the composition of teachers, expressed through percentage of their academic and/or professional titles.

The study programme administration attracts Doctoral students to participate in the implementation of the study programme. The mentioned is a good way to train the Doctoral students for teaching. On the other hand, it is strange (a bit unacceptable), the percentage of the professors (7.7% or 1 member) to be lower than the percentage of the Doctoral students involved in the implementation of the study programme.

Various mechanisms for cooperation in the processes of successful achievement of the study programme goals and intended learning outcomes of study courses, such as, invitation to the teachers from other universities to participate in the realisation of the study programme, involvement of professionals from industry in delivering of whole courses or only practical classes, are put in place. In addition, the opinion of students and employers regarding improvements of content, teaching, learning and assessment methods is taken into account. In this context, the

participation of students and employers in the creation of the study programme through various surveys, meetings, events, should be especially emphasised.

The professional biographies of teachers involved in realization of this study programme are in line, (SAR, additional materials), with the requirements of criteria 2.4.4.

Strengths:
1. Good collaboration among academic staff on one hand, students and employers on the other hand in various processes of upgrading the study programme.

Weaknesses:
1. Low percentage of academic staff members holds a Doctoral degree. There is a need for improvement.

Assessment of the requirement [7]

1 R7 - Compliance of the qualification of the academic staff and visiting professors, visiting associate professors, visiting docents, visiting lecturers and visiting assistants with the conditions for the implementation of the study programme and the requirements set out in the respective regulatory enactments.

Assessment of compliance: Fully compliant

Law on Higher Education Institutions, Latvia Section 39,p.23 Academic Staff of Vocational Study Programmes

2.5. Assessment of the Compliance

Requirements

1 1 - The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard

Assessment of compliance: Fully compliant

There are 2 variants for the study programme Geomatics (47581). First - 1,5 years (60CP); second - 2,5 years (100) CP. Study programme complies with the Professional Higher Education Standard (Cabinet of Ministers No 512.) The first programme has 7CP worth of mandatory study courses; 27CP of elective study courses in field specialisation and 26CP for masters thesis and internship. Second programme has 14 CP worth of mandatory courses, 28CP of elective study courses in field specialisation, 32 CP in internship and 20 for masters thesis. See annexes 6.pielikums and 9.pielikums.

2 2 - The study programme complies with a valid professional standard or the requirements for the professional qualification (if there is no professional standard required for the relevant occupation) provided if the completion of the study programme leads to a professional qualification (if applicable)

Assessment of compliance: Fully compliant

Study programme variant with 2,5 years provides qualification in civil engineering. Study programme provides necessary study courses to meet the requirements set in standard. Latest standard is brand new and approved in 13.10.2021. See annex: 7. pielikums and https://registri.visc.gov.lv/profizglitiba/dokumenti/standarti/2017/PS-184.pdf

3 3 - 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 561 , Paragraph two and Section 562 , Paragraph two of the Law on Higher Education Institutions.

Assessment of compliance: Partially compliant

Study course descriptions are well prepared and they contain all basic knowledge on the length, syllabus, learning outcomes, and evaluation methods in the study course. Nevertheless, compulsory literature should be revised and updated, because some of the literature is from 2000s'. To create even better study course descriptions in the future RTU can consider adding a table which includes on what lecture, lesson what type of knowledge check will be held, and add more detailed descriptions on what will be learned in each lecture, lesson. See annex: 10.pielikums.

4 4 - The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure according to which state recognised documents of higher education are issued.

Assessment of compliance: Fully compliant

Diplomas issued complies with the state legislation. See annex Diplomu paraugiLV_Eng.

5 5 - 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 Higher Education Institutions.

Assessment of compliance: Not relevant

Not applicable

6 6 - 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 Higher Education Institutions.

Assessment of compliance: Not relevant

Not applicable

7 7 - 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 (if applicable).

Assessment of compliance: Not relevant

Not applicable

8 8 - 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

Academic staff has sufficient latvian language knowledge for implementing study courses, see annex : Apliecinājums - valsts valodas prasme.

9 9 - 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 (if applicable).

Assessment of compliance: Not relevant

Not applicable

10 10 - The sample of the study agreement complies with the mandatory provisions to be included in the study agreement.

Assessment of compliance: Fully compliant

Study agreements include all necessary parts set in legislation. See the annex: Studiju līgumi

11 11 - The higher education institution / college has provided confirmation that students will be provided with opportunities to continue their education in another study programme or another higher education institution or college (agreement with another accredited higher education institution or college) if the implementation of the study programme is terminated.

Assessment of compliance: Fully compliant

The RTU has an agreement with LLU (Latvia University of Life Sciences and Technologies) that in case the study programme will be terminated students will be provided with the option to continue studies in LLU. See file VienosanĖs_LLU un RTU_Arhitektura_buvnieciba.RTU in future should provide information about exactly which study programme students can continue their studies. This information also would be beneficial for the students

12 12 - The higher education institution / college has provided confirmation that students are guaranteed compensation for losses if the study programme is not accredited or the study programme’s license is revoked due to the actions (actions or omissions) of the higher education institution or college and the student does not wish to continue studies in another study programme.

Assessment of compliance: Fully compliant

RTU confirms that they will compensate losses for students in case of termination of study programme. See annex: Apliecinājums - par zaudējumu kompensāciju

13 13 - The joint study programmes comply with the requirements prescribed in Section 55.(1), Paragraphs one, two, and seven of the Law on Higher Education Institutions (if applicable)

Assessment of compliance: Not relevant

Not applicable

14 14 - Compliance with the requirements specified in other regulatory enactments that apply to the study programme being assessed (if applicable)

Assessment of compliance: Fully compliant

RTU has indicated that this study programme complies with Civil Engineering law (Pursuant to Article 13 of the Civil Engineering Law). See annex: Compliance of the study programme with the specific regulatory framework of the relevant sector.

Assessment of the requirement [8]

1 R8 - Compliance of the study programme with the requirements set forth in the Law on Higher Education Institutions and other regulatory enactments.

Assessment of compliance: Fully compliant

All requirements are met and fulfilled, study programme complies with the legislation.

General conclusions about the study programme, indicating the most important strengths and weaknesses of the study programme

Overall the professional master study programme “Geomatics” fulfills all the relevant requirements. Only insignificant shortcomings have been identified, most notably the low enrolment numbers, which should be increased. Furthermore, the academic staff with a doctoral degree should be increased. In terms of study content, more regular study activities with the industry should be implemented.
Distance learning opportunities are provided in sufficient quantities and the University provides the necessary study and technical resources to the student. Graduates are in great demand in the labor market.
The aims of the programme are in line with state education standards, the required professional skills and motivation for lifelong learning, while the requirements of the European Qualifications Framework are followed in the processes of assuring the quality of implementation and learning outcomes accomplishment.
The organisation and realization of the internships are regulated by a contract signed by the University, students and host.
The funding available to the study programme, funding sources and the use of funding ensures full implementation of the study process.

Strengths:
Distance learning opportunities are provided in sufficient quantities and the University provides the necessary study and technical resources to the student.
Graduates are in great demand in the labor market.
The aims of the programme are in line with state education standards, the required professional skills and motivation for lifelong learning, while the requirements of the European Qualifications Framework are followed in the processes of assuring the quality of implementation and learning outcomes accomplishment.

Evaluation of the study programme "Geomatics"

Evaluation of the study programme:

Good

2.6. Recommendations for the Study Programme "Geomatics"

Short-term recommendations

Finding new ways for increasing the number of students - promotional activities, open days for perspective students, offering scholarships for best candidates

Long-term recommendations

Improvement of the academic staff structure when it comes to teachers who hold a doctoral degree.
A strategy for increasing enrolment numbers should be devised and implemented
More regular study activities involving the industry should be implemented

II - "Civil Engineering" ASSESSMENT

II - "Civil Engineering" ASSESSMENT

2.1. Indicators Describing the Study Programme

Analysis

2.1.1. The Professional Master Study Programme Civil Engineering (47582), which is offered in Latvian and English, was Accredited by the decision of the Accreditation Commission of LR Ministry of Education and Science of 29 May, 2017 – accreditation certificate No. 2020/39.
As stated in the SAR and in Annex 9, there are two types of implementation of the study programme: 1 year, which corresponds to 40 CP and 2 years and 6 months, which corresponds to 100 CP. The implementation of both types of studies is full-time. Both types of implementation include compulsory study courses, limited choice study courses, pedagogy and psychology study courses, as well as practical placement and state examination. The study programme is in compliance with the study field and its aims are in line with the strategic objectives of RTU. The study programme has been developed according to the Law on Higher Education Institutions of the Republic of Latvia and the Classification of Education of the Republic of Latvia.
The study programme's curriculum has been designed to allow alumni to develop their careers at enterprises that operate in the construction sector both as civil works managers, and as civil engineers.

2.1.2. The study programme also uses the management system that is described in www.rtu.lv/content/view/5257/1874/lang,lv/, to assure quality of implementation and learning outcome accomplishment. Like before, the principles of the Latvian Qualifications Framework (LQF) and the European Qualifications Framework (EQF) are closely observed during the implementation and development of the study programme.
According to the programme's structure, it is open to applicants with a bachelor's degree. The professional Master study programme provides skills and knowledge that will allow the student to engage in social and professional activities, and to have contact with academic and professional circles in Latvia and abroad. Given that this is a professional programme, it strives to offer field trips to students. The Experts Group also verified through the interviews with students that most of them work and study at the same time, thus, the students already have experience that is developed directly through their professional activities within the industry.
The Academic Bachelor Study Programme "Civil Engineering" has been developed in accordance with the Law on Higher Education Institutions of the Republic of Latvia and the Classification of Education of the Republic of Latvia. The aims, objectives, learning outcomes and admission requirements are interrelated. In order to achieve the aims of the programme, programme learning outcomes are defined (see planned learning outcomes in SAR). It was found that the learning objectives for both programme options can be achieved. The Experts Team found that the duration and scope of the study programme implementation for the study programme implementation options, as well as the implementation language, are reasonable and justified.

2.1.3 The study programme was changed based on recommendations from different stakeholders and external evaluators. One example was the change in the Internship of the study programme that was amended, where the formulating learning outcomes were integrated into the learning process. Additionally, new courses were added: BRC409 "Engineering Geology of Latvia", BRC582 "Special Course of Geotechnical Engineering", BBR748 "Modern Methods and Equipment for Industrial Waste Treatment and Recycling" and BBR749 "Modern Building Machines and Equipment". Existing course quality improvements were also reported. For example, industry trend-related changes have been made to the study courses BKA700 Modern materials for developing

construction. This shows that Civil Engineering is updating the study programme integrating new technology and keeping it up to date.
It must be noted here that due to changes in the qualification structure of the branches and the legislation of the Republic of Latvia, the professional qualification obtained in the professional master's study programme “Civil Engineering” was adjusted from “engineer of civil engineering” to “civil engineer”.

2.1.4. The economic and social justification is in place since the Latvian market requires for more experts in this field. It was reported that as of May 2021, the total number of students enrolled in the programme “Civil Engineering” was 92, which was less than half the number of students enrolled in 2017. This finding further confirms the overall problem with student number decrease noted in general in the country and the Baltic region. It must be noted here that in total 21 international students chose to study at the programme during the whole reporting period.

2.1.5. N/A

Conclusions on this set of criteria, by specifying strengths and weaknesses

There are two types of implementation of the study programme: 1 year, which corresponds to 40 CP and 2 years and 6 months, which corresponds to 100 CP and both are in line with the RTU strategic aims.
The study programme is updated according to the needs of the industry and the Latvian market. All stakeholders participate in this procedure, where their feedback is used to add new courses or improve existing ones.

Strengths:
1. The study programme is updated on a regular basis according to the needs of the industry and Latvian market.

Weakness:
1. The number of students is dropping.

2.2. The Content of Studies and Implementation Thereof

Analysis

2.2.1. The objective of the professional master study programme Civil Engineering (47582) is to prepare graduates for careers in higher education or in practice. In respect of the former, studies include training for doctoral studies and pedagogical skills. In respect of the latter, the option is open to an extended duration of studies leading to a professional qualification as ‘civil engineer’. These are very different drivers. The programme aims are set out clearly in five statements setting out the expectations of graduate attributes. The attributes are similar in some ways to the bachelors level except that the emphasis in the master’s programme is heavily weighted to a greater depth of knowledge, not least in theoretical aspects of the principles underlying civil engineering practice.
The modules in the 1-year programme comprise specialist topics, research skills, psychology and pedagogy. The modules in the 2 year 6 month programme have a larger number of compulsory and elective modules, together with a longer internship. Modules are mapped to programme outcomes to ensure that all requirements are met in respect of knowledge, skills and competence (SAR, Annex 8 and p.555). The academic staff are engaged in research and the course material is constantly updated.
The learning outcomes for each module are set out in a comprehensive descriptor template (SAR,

Annex 10). The descriptors are accessible to all relevant stakeholders through the ORTUS platform. Correlation of learning outcomes in the internship with outcomes in other modules have recently been strengthened. The learning outcomes are adequate but the phraseology could be improved to the benefit of students, those delivering the programmes and all those responsible for challenging the students to achieve their full potential. The same comments apply as in the other programmes: the phraseology (especially the dominant verb in a sentence) could be improved to better challenge the students to achieve their full potential as they progress through the stages of the programme. Specifically there is a need to explicitly set out the incremental rise in expectations of learning and assessment criteria at each stage. Sentences beginning with phrases such as “The ability to ….” could usefully be replaced by phrases beginning with “define”, “infer”, “calculate”, “analyse”, “evaluate”, “design” etc., to reflect the increasing level of expectation from the learners as they progress through the programme.
The aims, suite of modules and content of the 2 year 6 month programme meet the needs of industry and comply with the requirements for the second professional level of ‘civil engineer’ (PS-184). There is a very strong need for graduates in the market. Currently the demand exceeds the supply and therefore the graduates of the longer version of the programme are highly valued by industry. The decreased number of graduates in recent years is because many potential master’s degree candidates get employment after the bachelor’s degree and do not go on to further studies.

2.2.2. The academic staff and students of the programme regularly publish research findings and present their work at research conferences (SAR, p.562). The awarding of the degree takes account of the student’s contribution to advancing the art and science of engineering as evidenced in their final thesis.

2.2.3. The study implementation method is student-centred. Students are involved in programme development through their feedback. Summative assessment forms a central principle in the student learning experience (SAR, p.559). The Expert Group determined through meetings with students of Civil Engineering programmes that RTU respond in a timely manner to feedback on instances where student-centred learning and teaching principles are not reflected in the lecturer’s performance.

2.2.4. Internships form a part of both the 1-year and the 2 year 6 month programmes. The internships are carefully organised on a student-centred case-by-case basis. Those doing the longer period of study complete an internship of 32 credit points. Those on the 1-year programme already have prior internship experience from bachelor’s study and only do a 6 credit point top up internship (SAR, p.561). The learning outcomes have recently been updated to better integrate the internships with the learning outcomes of other modules. The organisation of the internships is highly effective with prior consultation on the specific expertise of the host company to deliver achievable learning outcomes in one of a number of streams. The Expert Group learned in meetings with stakeholders that internship is arranged in respect of one of the streams. A tripartite contract (RTU-student-host) is signed off to comply with the requirements of regulatory enactments. The provision of internships for foreign students taking the English language study form has not presented any difficulties. This is due to a combination of three factors: commonality of the graphical form of communication; commonality of European codes and standards; international outlook of many Latvian enterprises. Nevertheless, the option also exists for foreign students to complete an internship in the Faculty of Civil Engineering’s research laboratories on a national or international project (SER, p.561).

2.2.5. Not applicable to this professional master study programme.

2.2.6. The final theses test the students competence in scientific research. An additional design

project must be completed by those seeking the ‘civil engineer’ qualification. The work involves researching a problem and designing a solution, underpinned by theoretical substantiation. The communication skills of students are enhanced through presentation of their research at an internal RTU conference (SAR, p.562). Assessment includes a viva voce examination with employer representatives.

The Expert Group inspected a sample of final works of the first professional level, professional bachelors and professional masters. In all cases of the final design project it was found that the final works were strong on a test of knowledge but weak on providing students with an opportunity to demonstrate their ability to synthesise competing agendas in a multidisciplinary project and demonstrate informed judgement. Final works do not include a comprehensive set of required knowledge, in accordance with the qualification requirements for a Civil (building) engineer - see essential requirements of structures (specified in Regulation (EC) No. 305/2011 of the European Parliament and of the Council and Section 9 of the Construction Law).

Conclusions on this set of criteria, by specifying strengths and weaknesses

The dual objectives of the professional master study programme is to prepare graduates for careers in higher education or, through a longer period of study, entering practice as a qualified ‘civil engineer’ (PS-184). In respect of the latter, the option is open to an extended duration of studies leading to a professional qualification as ‘civil engineer’. The shared programme aims set out graduate attributes that are heavily weighted to a greater depth of knowledge, not least in theoretical aspects of the principles underlying civil engineering practice. In that narrow perspective the programme aims are compatible. However in the wider perspective it is difficult to comprehend how two very divergent graduate profiles can be served from a common source.

The modules include specialist topics, research skills, psychology and pedagogy. The modules are fully mapped to programme outcomes. Modules are regularly updated based on the academic staff engagement in research.

The learning outcomes for each module are set out in a comprehensive descriptor template and the same comments apply as in the other degree programme in civil engineering. That is, the phraseology (especially the dominant verb in a sentence) could be improved to better challenge the students to achieve their full potential as they progress through the stages of the programme.

Those admitted to the 1 year option have already demonstrated their relevance to industry through their professional qualification and this is enhanced by their masters degree studies. Those admitted to the 2 year 6 month programme find a coherent set of aims, suite of modules and content to meet the needs of industry while additionally complying with the requirements for the second professional level of ‘civil engineer’ (PS-184). A decline in the number of students graduating from the programme with the ‘civil engineering’ qualification is not due to any perceived shortcomings in the programme by industry. The contrary is the case - currently the demand exceeds the supply and many potential master’s degree candidates get employment after the bachelor’s degree and do not go on to further studies.

The academic staff and students of the programme regularly publish research findings and the awarding of the degree takes account of the student’s contribution to advancing the art and science of engineering as evidenced in their final thesis.

The study implementation method is student-centred. Students are involved in programme development through their feedback. Summative assessment forms a central principle in the student learning experience.

Internships are organised on a student-centred case-by-case basis. Those doing the longer period of study complete an internship of 32 credit points. Those on the 1-year programme already have prior internship experience from bachelor’s study and only do a 6 credit point top-up internship. The learning outcomes are integrated with the learning outcomes of other modules.

The final thesis involves researching a problem and designing a solution, underpinned by theoretical substantiation An additional design project must be completed by those seeking the 'civil engineer' qualification. Communication skills of students are also emphasised through an internal RTU conference presentation of their research. The Expert Group found that, in common with the other level professional degree programmes in civil engineering, the final design project was found to be strong on a test of knowledge but weak on providing students with an opportunity to demonstrate their ability to synthesise competing agendas in a multidisciplinary project and demonstrate informed judgement.

Strengths:
No exceptional points to comment on.

Weaknesses:
1. The programme serves two very different graduate profiles and this must surely constrain the independent development of excellence in each of the two streams of the programme.
2. The phraseology of learning outcomes does not reflect the incremental higher order of challenge to the students as they progress up through the stages of the programme.
3. The final works over-emphasise a test of technical competence in design of elements rather than the students' ability to creatively design solutions with competing design constraints of architectural issues, fire safety, energy efficiency building service networks and cost.

Assessment of the requirement [5] (applicable only to master's or doctoral study programmes)

1 R5 - The study programme for obtaining a master's or doctoral degree is based on the achievements and findings of the respective field of science or field of artistic creation.

Assessment of compliance: Fully compliant

The academic staff and students of the programme regularly publish research findings and present their work at research conferences. Success in this peer review process demonstrates the relationship between the study programme and the state-of-the-art in the field of science.

2.3. Resources and Provision of the Study Programme

Analysis

2.3.1. The study program Civil Engineering (47582) provides the qualification "Civil Engineer" with a Master's degree.
RTU funding from the basic state budget is made up of the study base financing corresponding to the list of study programmes and the number of students; it is used to cover such expenses as utilities, taxes, infrastructure maintenance (including data for the Student and Graduate Register), purchase of equipment and supplies, staff remuneration, and funding for research activities.
Analysing the financing procedure of the study programmes and the study directions at RTU as a whole, it can be seen that the state basic budget and local fee-paying student funding, in the long run, are determined taking into account the basic principles established by the state.
The library, material and technical provision and financial provision correspond to specific features and conditions for the implementation of the study programme, create preconditions for achieving study results and indicate the possibility to ensure a quality study process.
Students learn modern teaching methods using such modern modelling and structural calculations computer programs as Autodesk AutoCAD, Axis, Robot, RFEM, Revit and others. In addition to the basic study program, master students acquire finite element and physical process modelling

software ANSYS, NASTRAN, LS-DYNA, ABAQUS.
The ORTUS platform has well-organized teaching materials, literature, curriculum and correspondence with teachers and trainers. Learning outcomes are good.
The measuring instruments purchased by the university and used in the training process are not fully calibrated. Their readings are not completely verifiable. During the test procedure, some measuring equipment is not working or is not ready for operation.
After completion of the construction, the RTU Ķīpsala campus is becoming modern engineering study centre in the Baltic States.
The issue of sustainable development is taken into account in the construction process of the campus.

2.3.2. N/A

2.3.3. The financial provision corresponds to the specifics and conditions of the study programme implementation, creates preconditions for achieving the study results and indicates the possibility to ensure a quality study process.
Minimum number of students to ensure profitability of the study programme:
On the basis of the 2015 Ministry of Education and Science "Study on updating of study costs coefficient in higher education and preparation of proposals for consolidating them", as well as empirical calculations of RTU and according to expert evaluations, in order to ensure profitability of the study programme, the RTU determines the minimum number of students:
For full-time intramural local students: 19 students.
For part-time intramural and part-time extramural local students: 15 students.
For full-time intramural foreign students: 12-20 students depending on the country of origin (i.e., paid tuition fees (European Union, Commonwealth of Independent States, other)).
RTU also ensures the implementation of study programmes with a smaller number of students in those study programmes that are strategically important for RTU and the state, as well as in the new study programmes in their first years of implementation. In order to ensure the effectiveness of study programmes with a small number of students classes are planned jointly for local and foreign students, if it is permitted by the specifics of the study course and the language of implementation, and other activities that do not lessen the quality of studies

Conclusions on this set of criteria, by specifying strengths and weaknesses

Overall resources and provision of the study programme are compliant for the study programme.

Strengths:
1. The ORTUS platform has well-organized teaching materials, literature, curriculum and correspondence with lecturers and professors.
2. The technical provision of study materials, instruments, measuring equipment is sufficient and corresponds to the study plan and content.

Weaknesses:
1. The measuring instruments are not fully calibrated and during the test procedure some measuring equipment is not ready for operation.

Assessment of the requirement [6]

1 R6 - Compliance of the study provision, science provision (if applicable), informative provision (including library), material and technical provision and financial provision with the conditions for the implementation of the study programme and ensuring the achievement of learning outcomes

Assessment of compliance: Fully compliant

The study programme has all the necessary provisions for the implementation of the learning outcomes

2.4. Teaching Staff

Analysis

2.4.1. The number of teachers per department, involved in delivery of study courses in the frame of this professional study programme Civil Engineering (47582) is:
Department of Building Structures – 11 academic staff members, including 3 professors, 2 associate professors, 5 assistant professors and 1 lecturer.
Department of Construction Mechanics - 4 academic staff members, including 1 associate professor, 1 leading researcher, 1 assistant professor and 1 lecturer.
Department of Computer Aided Engineering Graphics - 4 teaching staff members, (1 academic, 1 assistant professor, 1 practical assistant professor and 1 lecturer.
Department of Civil Engineering -11 academic staff members, (1 associate professor, 4 assistant professors, 3 lecturers, 1 assistant, 2 research assistants).
Department of Construction Production - 8 academic staff members, including 2 professors, 2 associate professors, 2 assistant professors, 1 senior researcher and 1 researcher.
Department of Composite Materials and Structures – 4 members of academic staff, (2 professors, 1 assistant professor and 1 lecturer).
Department of Building Materials and Building Products – 11 teachers, (2 professors, 1 associate professor, 4 assistant professors, 1 senior researcher and 1 researcher).
Detailed analysis of the professional biographies of the teachers, who participate in study programmes realisation, shows that they are constantly working to improve their CVs in order to meet the legal requirements, thus contributing to a higher level of quality in study courses delivering. (Achievement of the goals, tasks and results of the study programme).
The question related to the unbalanced number of teachers in various departments is relevant for this study programme too. Bearing in mind the discussions with the academic staff, (15th of February 2022) teachers are involved in realisation of the study process in all departments.
The qualifications of teachers are presented in detail, (SAR, p.568 - p.574). It can be concluded that they are constantly improving through scientific research works, (participation in international conferences and projects - as members of the team or leaders, preparation of scientific papers, supervisors of Doctoral, Master or Bachelor thesis, experts in the field of civil engineering within the Latvian Council of Science, organising of free study courses).

2.4.2. Number of teaching staff members in total is 13 professors – Doctors of Science, 4 elected associate professors – Doctors of Science, 7 assistant professors, 3 lecturers, 2 leading researchers, 1 researcher. The presented structure of academic staff is constantly changing due to different factors that are common for Higher Education Institutions. Table on page 575, (SAR), contains data regarding the number of teachers with various academic positions, in 2016/2017 academic year and 2020/2021 academic year. That is, 13 professors in 2016/2017,(the same number is in 2020/2021); 4 associate professors in 2016/2017 and 2020/2021; one more assistant professor in 2020/2021,(from 6 to 7); increasing the number of lectors from 0 to 3, as well as the number of leading researchers from 1 to 2, and number of researchers from 0 to 1. It can be seen that there are no significant changes, except in the number of lecturers, (from 0 to 3).
In accordance with SAR, p. 575, various measures regarding the positive impact of changes in the composition of the academic staff, are put in place. For that reason, the SAM 8.2.2. project “Strengthening of Academic Personnel of Riga Technical University in Strategic Specialisation Areas”

is implemented. (among other tasks, it is oriented towards renewal of academic personnel, developing of teachers' competencies in professional English, organising of specialised training courses, signing of annual agreement with faculties within RTU, regarding specific quantitative indicators of study process, scientific activities, valorisation).
The student – faculty ratio is 92/30, (one member of teaching staff to 3 students). – At the time of submission of SAR.

2.4.3. N/A

2.4.4. This Professional Master Study Programme is also part of civil engineering study programmes which are delivered in the frame of RTU. The various qualifications of teachers (based on their scientific activities, participation in artistic events related to the aim and tasks of the programme, as well as their professional experiences) are in line with the requirements within the criteria 2.4.4. Namely, this statement is based on the results of comparing the data in SAR (p.228) and information presented in additional materials provided by the University (available on e-platform). The mentioned annexes "Biographies of the teaching staff members, (Curriculum Vitae in Euro pass format)", "Summary of quantitative data on scientific and/ or applied research and / or artistic creation activities corresponding to the study field in the reporting period" and "List of the publications, patents, and artistic creations of the teaching staff over the reporting period", create a good base for detailed assessment of this criteria (Study Field appendixes 2.3 and 2.4, as well as SAR p.562-568).

2.4.5. Application of various mechanisms, (already presented and analysed in other study programmes in the frame of Civil Engineering), that should lead to the fulfilment of the study programme tasks and goals are applied.

Conclusions on this set of criteria, by indicating strengths and weaknesses

The presented figures and teachers' qualifications meet the legal requirements - (Chapter VI – Studies in an Institution of Higher Education, Section 55 – Study programmes – Law on Higher Education Institutions). The professional career development of the academic staff is based on conducting lectures and training courses, preparation of various publications, supervision of students' theses, (doctoral, master, bachelor), management of national and international scientific research as well as professional projects, participation in University legal bodies (on various levels - RTU, Faculty). The mentioned characteristics of personal academic development are in line with the aim of this programme: ". . . Ensure academic education in the field of engineering and subfield of civil engineering and construction in order to train and educate students and prepare them for further studies at the Doctoral study programme". (SAR, p. 546).
Composition of the academic staff, regarding number of teachers and their academic positions, are monitored by the management team. In accordance with presented data, there are no significant changes in the past 5 years.
Various forms of mutual activities, (meetings, interconnection of lectures and practical classes, methodological seminars, participation in projects), are undertaken by the academic staff. The main aim is oriented towards promotion of cooperation and strengthening the teachers' competencies related to practical realisation of higher level of connection between study programme and its courses/modules.

Detailed analysis of the SAR and materials on e-platform, leads to the conclusion that teachers who participate in delivery of this study programme follow and meet the requirements of criteria 2.4.4.

Strengths:
1. Sufficiency and appropriateness of the academic staff involved in the study programme realisation.

Weaknesses:
1. There are no significant weaknesses for teaching staff in this study programme.

Assessment of the requirement [7]

1 R7 - Compliance of the qualification of the academic staff and visiting professors, visiting associate professors, visiting docents, visiting lecturers and visiting assistants with the conditions for the implementation of the study programme and the requirements set out in the respective regulatory enactments.

Assessment of compliance: Fully compliant

Law on Higher Education Institutions, Latvia, Section 39, Academic Staff of Vocational Study Programmes.

2.5. Assessment of the Compliance

Requirements

1 1 - The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard

Assessment of compliance: Fully compliant

Study programme Civil Engineering (47582) complies with Professional Higher Education Standard (Cabinet of Ministers No. 512) Study programme (Option 1) total volume 40 CP (duration of studies 1 year) of which at least 8 CP are compulsory part covering overall educational, field theoretical, field practical study courses, at least 6 CP for limited choice study courses part, Traineeship, (Practical Placement) at least 6 CP and at least 20 CP for final, state examinations, which include a Master Thesis.
Study programme (Option 2) total volume 100 CP (duration of studies 2.5 years) of which at least 23 CP are compulsory part covering overall educational, field theoretical, field practical study courses, at least 19 CP for limited choice study courses part, Traineeship, (Practical Placement) at least 32 CP and at least 26 CP for final, state examinations, which include a Master Thesis with Engineering Design Project.
Compliance with the study programme with the State Education Standard Annex No 6.

2 2 - The study programme complies with a valid professional standard or the requirements for the professional qualification (if there is no professional standard required for the relevant occupation) provided if the completion of the study programme leads to a professional qualification (if applicable)

Assessment of compliance: Fully compliant

Meets the criteria and professional requirements “Regulations of the Cabinet of Ministers on the Classifier of Professions, Basic Tasks Corresponding to the Profession and Basic Qualification Requirements No. 264 (May 23, 2017)” and “Standard for the profession of Building engineer” (October 13, 2021)

3 3 - 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 561 , Paragraph two and Section 562 , Paragraph two of the Law on Higher Education Institutions.

Assessment of compliance: Partially compliant

Study course descriptions are well prepared and they contain all basic knowledge on the length, syllabus, learning outcomes, and evaluation methods in the study course. Nevertheless, compulsory literature should be revised and updated, because some of the literature is from 1970-2000s'. To create even better study course descriptions in the future RTU can consider adding a table which includes on what lecture, lesson what type of knowledge check will be held, and add more detailed descriptions on what will be learned in each lecture, lesson. Some descriptions contain the title of databases in Latvian See annex: RBGB0_EN.

4 4 - The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure according to which state recognised documents of higher education are issued.

Assessment of compliance: Fully compliant

Diploma issued complies with the state legislation. See annex of the study programme: Sample of the diploma.

5 5 - 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 Higher Education Institutions.

Assessment of compliance: Not relevant

6 6 - 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 Higher Education Institutions.

Assessment of compliance: Not relevant

7 7 - 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 (if applicable).

Assessment of compliance: Not relevant

8 8 - 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

Academic staff has sufficient latvian language knowledge for implementing study courses, see annex: Apliecinājums - valsts valodas prasme.

9 9 - 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 (if applicable).

Assessment of compliance: Fully compliant

Academic staff have sufficient English language knowledge for implementing study courses. Confirmation available in annex: Apliecinājums - svešvalodu prasme.

10 10 - The sample of the study agreement complies with the mandatory provisions to be included in the study agreement.

Assessment of compliance: Fully compliant

Study agreements include all necessary parts set in legislation. See the annex: Studiju līgumi.

11 11 - The higher education institution / college has provided confirmation that students will be provided with opportunities to continue their education in another study programme or another higher education institution or college (agreement with another accredited higher education institution or college) if the implementation of the study programme is terminated.

Assessment of compliance: Fully compliant

The RTU has an agreement with LLU (Latvia University of Life Sciences and Technologies) that in case the study programme will be terminated students will be provided with option to continue studies in LLU. See file Agreement LLU and RTU. RTU in future should provide information about exactly which study programme students can continue their studies. This information also would be beneficial for the students.

12 12 - The higher education institution / college has provided confirmation that students are guaranteed compensation for losses if the study programme is not accredited or the study programme’s license is revoked due to the actions (actions or omissions) of the higher education institution or college and the student does not wish to continue studies in another study programme.

Assessment of compliance: Fully compliant

RTU confirms that they will compensate losses for students in case of termination of study programme. See annex: Confirmation on compensation for losses

13 13 - The joint study programmes comply with the requirements prescribed in Section 55.(1), Paragraphs one, two, and seven of the Law on Higher Education Institutions (if applicable)

Assessment of compliance: Not relevant

14 14 - Compliance with the requirements specified in other regulatory enactments that apply to the study programme being assessed (if applicable)

Assessment of compliance: Fully compliant

RTU has indicated that this study programme complies with Civil Engineering law (Pursuant to Article 13 of the Civil Engineering Law). See annex: Compliance of the study programme with the specific regulatory framework of the relevant sector.

Assessment of the requirement [8]

1 R8 - Compliance of the study programme with the requirements set forth in the Law on Higher Education Institutions and other regulatory enactments.

Assessment of compliance: Fully compliant

All regulatory requirements are met and fullfiled.

General conclusions about the study programme, indicating the most important strengths and weaknesses of the study programme

No significant deficiencies were found.
There are two types of implementation of the study programme: 1 year, which corresponds to 40 CP and 2 years and 6 months, which corresponds to 100 CP and both are in line with the RTU strategic

aims.
The study programme is updated according to the needs of the industry and the Latvian market. All stakeholders participate in this procedure, where their feedback is used to add new courses or improve existing ones.
The modules were found to include specialist topics, research skills, psychology and pedagogy. The modules are fully mapped to programme outcomes. Modules are regularly updated based on the academic staff engagement in research.
The learning outcomes for each module are set out in a comprehensive descriptor template and the same comments apply as in the other degree programme in civil engineering. That is, the phraseology (especially the dominant verb in a sentence) could be improved to better challenge the students to achieve their full potential as they progress through the stages of the programme.
A decline in the number of students graduating from the programme with the 'civil engineering' qualification is not due to any perceived shortcomings in the programme by industry. The contrary is the case - currently the demand exceeds the supply and many potential master's degree candidates get employment after the bachelor's degree and do not go on to further studies.
The academic staff and students of the programme regularly publish research findings and the awarding of the degree takes account of the student's contribution to advancing the art and science of engineering as evidenced in their final thesis.
The study implementation method is student-centred. Students are involved in programme development through their feedback. Summative assessment forms a central principle in the student learning experience.
Internships are organised on a student-centred case-by-case basis. Those doing the longer period of study complete an internship of 32 credit points. Those on the 1-year programme already have prior internship experience from bachelor's study and only do a 6 credit point top-up internship. The learning outcomes are integrated with the learning outcomes of other modules.
The Expert Group found that, in common with the other level professional degree programmes in civil engineering, the final design projects were found to be strong on a test of knowledge but weak on providing students with an opportunity to demonstrate their ability to synthesise competing agendas in a multidisciplinary project and demonstrate informed judgement.

Evaluation of the study programme "Civil Engineering"

Evaluation of the study programme:

Good

2.6. Recommendations for the Study Programme "Civil Engineering"

Short-term recommendations

The programme should take steps in developing comprehensive course portfolios where all information about the course offering, students' performance, survey results and course instructor's report should be found. This will also help with future internal and external evaluations.
The measuring instruments purchased by the university and used in the training process are not fully calibrated. Their readings are not completely verifiable. During the test procedure, some measuring equipment is not working or is not ready for operation. This must be addressed.
The number of students is dropping. The study programme in collaboration with the university management should explore methods and strategies through which this issue can be addressed.

The Expert Group found that, in common with the other level professional degree programmes in civil engineering, the final design projects were found to be strong on a test of knowledge but weak on providing students with an opportunity to demonstrate their ability to synthesise competing agendas in a multidisciplinary project and demonstrate informed judgement. This has to be remedied.

Long-term recommendations

The programme learning outcomes were found to be very general. Therefore, the management of programme should rewrite the learning outcomes in order to make them clearer and more specific. This clearly indicates that a student who registers to the programme will be trained to develop lifelong learning skills, which are of utmost importance to any engineering graduate

Compulsory literature needs to be reviewed and updated (especially for obsolete publications from 1970-2000). We recommend not to include obsolete literature sources (older than 20 years) in the subject descriptions. Valid but older literature sources could be included in the list of additional literature sources as needed.

II - "Heat, Gas and Water Techology" ASSESSMENT

II - "Heat, Gas and Water Techology" ASSESSMENT

2.1. Indicators Describing the Study Programme

Analysis

2.1.1. The study programme Heat, Gas and Water Techology (47582) is regulated and complies with the Law on Higher Education Institutions of the Republic of Latvia and the Classification of Education of the Republic of Latvia (see Annex 6 RBCSO).

2.1.2. The professional master study programme “Heat, Gas and Water Technology” (47582) is a full-time study programme with a total length of 1 year and 2 additional forms with extra 20 CP modules or 60 CP forms with a length of 1.5 years for students from other programs in in Latvian. The study programme fits in and complies with the study field of Architecture and Construction, with emphasis on engineering. The total number of CP in the study programme is 40 CP, which equals to 60 ECTS, and two additional forms with extra 20 CP modules. The study programme was found to comply with the State Standard for Education. Admission requirements are a professional bachelor's degree in heat, gas and water engineering systems and / or a professional qualification of a heat, gas and water technology engineer, or an equivalent education, or a professional bachelor's degree in thermal energy and thermal engineering and / or a professional qualification of a heat energy and heat engineering engineer, or an equivalent education, or professional bachelor's degree in transport construction and / or professional qualification of transport construction civil engineer, or equivalent education. Finally, the degree awarded is a Professional Master Degree in Heat, Gas and Water Engineering Systems. There is room for improvement in administration work in terms of less paperwork submitted to the Faculty.
The title of the study programme, the awarded degree, aims and tasks are interrelated. The main study programme objectives and activities are oriented in providing practical works for students and to give comprehensive knowledge in the field of heat, gas and water engineering. After a successful completion of their study programme, students develop the necessary skills and are able to demonstrate understanding of the requirements of the regulatory enactments for the design,

installation and operation of building engineering systems and urban infrastructure systems.

2.1.3. Since the last accreditation, several improvements of the programme based on the previous period have been taken into account. For example, a better definition of learning outcomes of the Internship was established and their optimum integration into the study process through academic supervision and appropriate evaluation was performed. Consequently, according to SAR, improvements have been made to the internship part of the study programme, i.e., learning outcomes have been defined and better integrated into the study process, as well as academic supervision and appropriate evaluation have been ensured. The Faculty tries to change study modules and organise studies in small working groups.

2.1.4. According to SAR, the total number of students in April 2021 at the programme “Heat, Gas and Water Technology” was 27, which was around 3.8 times lower compared to 2017 (102 students). In 2020/2021, 22 new students enrolled in comparison to the 50 students enrolled in 2016/2017, thus, the number of students is found to be decreasing (see Annex 5 Students statistical data). As explained by the Faculty, the reduction is linked to stricter admission requirements.
Demand for highly qualified specialists in civil engineering is variable, graduates are mainly employed in private companies, municipal development departments and construction boards, design companies, public administrations and other sector-related organisations. The study programme was improved after the evaluation of the final examinations, as representatives of employers regularly take part in the work of Graduate Paper Examination, The Faculty has strong cooperation with employers since students in this programme are usually practicing engineers who need a building practice certificate. These additional modules are intended for students from other study programmes to acquire all the specified study courses necessary to obtain a certificate at the Latvian Heat, Gas and Water Technology Engineers Union Construction Specialists Certification Centre in "gas and sewer systems, including fire-fighting systems" field or in the “heating, venting and air-conditioning systems” field.

2.1.5 N/A

Conclusions on this set of criteria, by specifying strengths and weaknesses

The professional master study programme “Heat, Gas and Water Technology” (47582) is a full-time study programme with a total length of 1 year, and two additional forms with extra 20 CP modules (1.5 year 60 CP). The programme was found to be in line with the strategic objectives of RTU, while its graduates are employed by different organisations. The Faculty has strong cooperation with employers since students in this programme are usually practising engineers who need a building practice certificate.

Strengths:
1. The Faculty has strong cooperation with employers since students in this programme are usually practicing engineers who need a building practice certificate.

Weaknesses:
1. Due to several reasons, the number of students in the study programme “Heat, Gas and Water Technology” is decreasing.

2.2. The Content of Studies and Implementation Thereof

Analysis

2.2.1. The objective of the professional master study programme Heat, Gas and Water Techology (47582) is to further prepare engineering students specialising in the field of building system networks or to pursue an academic career and doctoral studies (SAR, p.395). The programme aims are set out clearly in nine statements (pp.403-404). The phraseology in the aims lacks the ambition expected at masters degree level with terms such as “are familiar with”, “able to understand”, which are more suited to the early stages of bachelor degree studies. This point is developed in respect of module learning outcomes in the next paragraph. The modules are well integrated and aligned with the programme outcomes through a planning map (SAR, Annex 9).
The learning outcomes for each module are set out in a comprehensive descriptor template (SAR, Annex 10). The descriptors are accessible to all relevant stakeholders through the ORTUS platform. The learning outcomes set out the knowledge, skills and competences to be achieved. The phraseology of the outcomes has been improved since the previous review but it has yet to fully capture the incremental challenge expected of students as they progress through the stages of study.

2.2.2. The degree is awarded based on research in the fields of expertise of the supervisors. At present the focus is on low energy buildings; building engineering systems; urban energy supply and urban water supply.

2.2.3. The programme is offered in Riga. The Expert Panel understand that information in the SAR (p.299 and p.401) is no longer valid regarding the use of distance learning for the branch campuses of Daugavpils and Liepaja, together with students in Daugavpils and Liepaja attending Riga for their laboratory work and students in senior years attending Daugavpils Study and Science Centre.
There is a strong emphasis on practical classes, which have recently been extended (SAR, p.400). Some modules are taught in English (SAR, p.401). Summative assessment is used (SAR, p.409). The internal quality assurance system operates effectively and includes student input. Student are surveyed through module questionnaires and the annual review at faculty level includes student representatives. The academic staff are supported in developing student-centred practices through continuing professional development courses on pedagogical developments (SAR, p.412).

2.2.4. The learning outcomes for internships have recently been updated. The outcome is appropriate for this level of study and is stated clearly: “To develop ability to make decisions based on the obtained data, to assess alternatives and find the best solution.” (SAR, p.413). Internships are organised on a student-centred case-by-case basis. A tripartite contract (RTU-student-host) is signed off to comply with the requirements of regulatory enactments. Joint supervision is conducted by nominated supervisors in both the university and the host organisation. The internship is assessed based on the student’s log, host company assessor’s report, student’s report and a presentation by the student (SAR, p.413).

2.2.5. Not applicable to this professional master study programme.

2.2.6. The final thesis is in the form of a research paper. The research paper is based on a topical issue in the field such as energy efficiency; spectral filtration technology; solar collectors; leachate purification; geothermal energy; hydraulic balancing in heating systems (SAR p.414-415). Following approval by an internal review, solutions are presented in public before an Examination Committee. The quality of the final works has been judged to be of a very high standard. In the reported period (2017-2020) 68 students averaged a score of 7.7 out of 10. Half of the final grade is assessed by the State Final Examination Committee which includes employer representatives.

Conclusions on this set of criteria, by specifying strengths and weaknesses

The objective of the professional master study programme is to further prepare engineering students specialising in the field of building system networks or to pursue an academic career and doctoral studies. The programme aims are set out clearly in nine statements but the phraseology in the aims lacks the ambition expected at masters degree level. The modules are well integrated and aligned with the programme outcomes through a planning map.
The learning outcomes for each module are set out in a comprehensive descriptor template and are accessible to all relevant stakeholders through the ORTUS platform. The learning outcomes set out the knowledge, skills and competences to be achieved. The phraseology of the outcomes has been improved since the previous review but it has yet to fully capture the incremental challenge expected of students as they progress through the stages of study.
The degree is awarded based on research in the fields of expertise of the supervisors. It is topical, especially in respect of sustainability in the use of energy.
The implementation method is student-centred. There is increasing use of e-learning technologies and a strong emphasis on practical classes. Some modules are taught in English. Summative assessment is used. The internal quality assurance system operates effectively and includes student input.
The learning outcomes for internships have recently been updated. The outcome is appropriate for this level of study. Internships are organised on a student-centred case-by-case basis. A tripartite contract (RTU-student-host) is signed off to comply with the requirements of regulatory enactments. Joint supervision is conducted by nominated supervisors in both the university and the host organisation.
The final thesis is in the form of a research paper based on a topical issue in the field of study. The quality of the final works has been judged to be of a very high standard. In the reported period (2017-2020) 68 students averaged a score of 7.7 out of 10. Half of the final grade is assessed by the State Final Examination Committee which includes employer representatives.

Strengths:
1. Clarity of the aim of the internship at masters degree level: “To develop ability to make decisions based on the obtained data, to assess alternatives and find the best solution.”
2. The academic staff are supported in developing student-centred practices through continuing professional development courses on pedagogical developments.
Weaknesses:
1. In general, the phraseology of learning outcomes does not reflect the incremental higher order of challenge to the students as they progress up through the stages of the programme.

Assessment of the requirement [5] (applicable only to master's or doctoral study programmes)

1 R5 - The study programme for obtaining a master's or doctoral degree is based on the achievements and findings of the respective field of science or field of artistic creation.

Assessment of compliance: Fully compliant

The degree is awarded based on research which is in one of the topical fields of expertise of the supervisors.

2.3. Resources and Provision of the Study Programme

Analysis

2.3.1. The study provision, both informative and material, technical, are compliant for the study programme Heat, Gas and Water Techology (47582). Informative resources are available from RTU

Scientific Library, online databases, e-books, e-journals. (SAR p. 417-418). There is a procedure developed for convenient ordering of the resources from the library and a procedure for each student to request a limited amount of new materials of special interest (according to info from site visit meetings with academic staff and students). In addition RTU ORTUS e-platform is a significant tool for student and teaching staff communication. ORTUS provides access for each student to all the data of the courses taken during the studies, and gives understanding of the course structure. Both students and teaching staff highly evaluate ORTUS. There are extensive refurbishment works going on in the premises. Numerous new laboratories will be opened, which will promote development of the practical component of the study courses and introduction of technologies in the study process. Laboratory equipment is continuously updated with new additions (SAR p. 416-416 and info from site visit meetings with teaching staff).

2.3.2. N/A.

2.3.3. The funding available to the study programme, funding sources and the use of funding ensures implementation of the study process. However there is always space for improvement. For example, as mentioned in the site visit meetings with the students and graduates, there is significant importance of cooperation with other professionals and students (architects, civil engineers), which could be more introduced in the studies. Those groups as well as some members of the teaching staff mentioned that laboratory learning could be given more emphasis. Above mentioned requires resources specially allocated as well. The funding and the cost per student has been increasing in the period of the study year 2017/2018 to 2020/2021, except the decrease in funding of the study year 2019/2020 (SAR p. 419). According to the annex to SAR Funding distribution between the cost items the major part (46%) is used for remuneration, leaving for example the position of purchase and modernization of equipment with 1% and business trip expenses less than 1%. It leaves a question - is such distribution sustainable in the long term as such a great part is allocated for first necessities? As stated in the SAR p. 420 the insufficient funding is being compensated by the active scientific work of staff and the associated financing from the industry. It leaves an open question if it is beneficial, strengthens the cooperation with industry or gives extra load to the teaching staff. The study programme has the minimum number of students to ensure the profitability of the study programme. According to the annex to SAR On minimal number of students in study programmes there must be at least 19 students in first level, master's level (including second level professional study programmes) – which is met (even at the study year 2020/2021of the lowest enrollment there were 22 students enrolled in study programme).

Conclusions on this set of criteria, by specifying strengths and weaknesses

Overall resources and provision of the study programme are compliant for the study programme. There is a decent provision of informative resources. Access to it is ensured convenient. Good material and technical provision, which will be significantly improved after ongoing extensive refurbishment works in the premises and opening of new laboratories. At the same time, it is even stated in the SAR that the funding is insufficient and is being compensated by the active scientific work of staff and the associated financing from the industry. It is also evident that the study programme would benefit from higher funding or distribution of funding providing a greater percentage for positions to provide more cooperation with other professionals and students (architects, civil engineers).

Strengths:
1. Provision of informative materials, availability of library resources.

2. Well functioning RTU e-platform ORTUS.
3. Well equipped workshop rooms.

Weaknesses:
1. The funding available to the study programme, the distribution of it.

Assessment of the requirement [6]

1 R6 - Compliance of the study provision, science provision (if applicable), informative provision (including library), material and technical provision and financial provision with the conditions for the implementation of the study programme and ensuring the achievement of learning outcomes

Assessment of compliance: Partially compliant

SAR p. 416-420. The study programme has the necessary provisions for the implementation of the learning outcomes. However insufficient funding is being compensated by the active scientific work of staff and the associated financing from the industry.

2.4. Teaching Staff

Analysis

2.4.1. The teaching staff associated with the programme Heat, Gas and Water Techology (47582) are highly qualified in the specialisation. The staff allocated to delivering the programme, averaging 30 people over the reported period, includes those with extensive experience in academia and practice. Currently five professors and six associate professors assigned to the programme results in 40% of the teaching staff being members of the Latvian Academy of Sciences. Membership of the Institute of Heat, Gas and Water Technology is held by most, if not all, of those delivering the programme (SAR, p.421).

2.4.2. The very significant drop in student numbers has allowed a period of rebalancing of the academic staff lecture loads. The staff profile has changed over the reported period in the form of renewal of capacity in a positive direction for future growth. While the overall number has remained largely unchanged, there has been a shift towards introducing new talent through the recruitment of three assistant professors. Two retirements and some rebalancing of professors' lecture loads has allowed those with recent experience in practice to join the team. These talented young researchers join the team of highly experienced academics. The present situation reflects a period of transition, with a significant drop of eight in the number of professors, associate professors and assistant professors being replaced by five staff in junior ranks (SAR, p.427). However it can be viewed as a positive development in respect of the improvements in the pedagogical approach that young teaching staff bring as part of their promotion activities and the RTU commitment to support the international research profiles of young researchers.
Clearly, with the greatly reduced number of students (from 102 to 27 in the reported period) and the stable number of staff (from 31to 28), the student:staff ratio is low. Using full-time equivalents the current figure is 2.25 (SAR, p.428).

2.4.3. Not applicable to this professional master study programme.

2.4.4. Overall the academic staff is involved in the processes of academic research. According to available information, the academic staff are continuously involved in producing research outputs and artistic achievements, and they have taken part in publications and/or relevant practical work experience (Study Field appendixes 2.3 and 2.4, as well as SAR p.414-420).

2.4.5. The Expert Panel noted during meetings with staff that a collegiate approach is taken to the implementation of the programme. This includes an annual review of course evaluations; joint attendance at methodological seminars; interactive discussions where staff share experience; and joint study tours where academic staff and students learn first-hand of recent developments in the field (SAR, p.428).

Conclusions on this set of criteria, by indicating strengths and weaknesses

The teaching staff associated with the programme are highly qualified in the specialisation. Currently 40% of the teaching staff are members of the Latvian Academy of Sciences. Membership of the Institute of Heat, Gas and Water Technology is held by most, if not all, of those delivering the programme.
The very significant drop in student numbers has allowed a period of rebalancing of the academic staff lecture loads. There has been a shift towards introducing new talent through the recruitment of three assistant professors, counterbalancing professorial retirements and some rebalancing of professors' lecture loads. Those joining the team have recent experience in practice to join the team. These talented young researchers bring improvements in the pedagogical approach, underpinned in their career development by the RTU commitment to support the international research profiles of young researchers. The student:staff ratio is low, at 2.25 using full-time equivalents.
A collegiate approach is taken to the implementation of the programme, including an annual review of course evaluations; joint attendance at methodological seminars; interactive discussions where staff share experience; and joint study tours where academic staff and students learn first hand of recent developments in the field.

Strengths:
1. The majority of staff are members of the Latvian Academy of Sciences, the Institute of Heat, Gas and Water Technology or both. There is an excellent collegiate atmosphere.
2. Extremely low student:staff ratio.

Weaknesses:
None noted.

Assessment of the requirement [7]

1 R7 - Compliance of the qualification of the academic staff and visiting professors, visiting associate professors, visiting docents, visiting lecturers and visiting assistants with the conditions for the implementation of the study programme and the requirements set out in the respective regulatory enactments.

Assessment of compliance: Fully compliant

CV's of professors, associate professors, assistant professors and one guest professor (SAR, p.421-426)

2.5. Assessment of the Compliance

Requirements

1 1 - The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard

Assessment of compliance: Fully compliant

Study programme Heat, Gas and Water Techology (47582) complies with Professional Higher Education Standard (Cabinet of Ministers No. 512).
Study programme total volume 40 CP in case of option 1, or 100 CP in case of option 2, of which study courses that ensure in-depth acquisition of the latest developments in theory and practice 12CP, Research work, creative work, design work and management study courses 6CP, internship 26 CP or 6 CP in case of option 2, Master's thesis 20 CP in case of option 1, Master's thesis with engineering part 20
Compliance with the study programme with the State Education Standard Annex No 6 RBCSO

2 2 - The study programme complies with a valid professional standard or the requirements for the professional qualification (if there is no professional standard required for the relevant occupation) provided if the completion of the study programme leads to a professional qualification (if applicable)

Assessment of compliance: Not relevant

3 3 - 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 561 , Paragraph two and Section 562 , Paragraph two of the Law on Higher Education Institutions.

Assessment of compliance: Partially compliant

Study course descriptions are well prepared and they contain all basic knowledge on the length, syllabus, learning outcomes, and evaluation methods in the study course. Nevertheless, compulsory literature should be revised and updated, because some of the literature is from 2000s'. To create even better study course descriptions in the future RTU can consider adding a table which includes on what lecture, lesson what type of knowledge check will be held, and add more detailed descriptions on what will be learned in each lecture, lesson. Some descriptions contain literature in Russian See annex: 10_ENG.

4 4 - The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure according to which state recognised documents of higher education are issued.

Assessment of compliance: Fully compliant

Diploma issued complies with the state legislation. See annex of the study programme: diploma paraugs

5 5 - 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 Higher Education Institutions.

Assessment of compliance: Not relevant

6 6 - 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 Higher Education Institutions.

Assessment of compliance: Not relevant

7 7 - 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 (if applicable).

Assessment of compliance: Not relevant

8 8 - 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

Academic staff has sufficient latvian language knowledge for implementing study courses, see annex : Confirmation knowledge of the state language

9 9 - 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 (if applicable).

Assessment of compliance: Not relevant

10 10 - The sample of the study agreement complies with the mandatory provisions to be included in the study agreement.

Assessment of compliance: Fully compliant

Study agreements include all necessary parts set in legislation. See the annex: Study_agreements.

11 11 - The higher education institution / college has provided confirmation that students will be provided with opportunities to continue their education in another study programme or another higher education institution or college (agreement with another accredited higher education institution or college) if the implementation of the study programme is terminated.

Assessment of compliance: Fully compliant

The RTU has an agreement with LLU (Latvia University of Life Sciences and Technologies) that in case the study programme will be terminated students will be provided with option to continue studies in LLU. See file Agreement LLU and RTU. RTU in future should provide information about exactly which study programme students can continue their studies. This information also would be beneficial for the students.

12 12 - The higher education institution / college has provided confirmation that students are guaranteed compensation for losses if the study programme is not accredited or the study programme’s license is revoked due to the actions (actions or omissions) of the higher education institution or college and the student does not wish to continue studies in another study programme.

Assessment of compliance: Fully compliant

RTU confirms that they will compensate losses for students in case of termination of study programme. See annex: Confirmation on compensation for losses.

13 13 - The joint study programmes comply with the requirements prescribed in Section 55.(1), Paragraphs one, two, and seven of the Law on Higher Education Institutions (if applicable)

Assessment of compliance: Not relevant

14 14 - Compliance with the requirements specified in other regulatory enactments that apply to the study programme being assessed (if applicable)

Assessment of compliance: Fully compliant

All regulatory requirements are met and fulfilled.

Assessment of the requirement [8]

1 R8 - Compliance of the study programme with the requirements set forth in the Law on Higher Education Institutions and other regulatory enactments.

Assessment of compliance: Fully compliant

All regulatory requirements are met and fulfilled.

General conclusions about the study programme, indicating the most important strengths and weaknesses of the study programme

It is concluded that the professional master study programme “Heat, Gas and Water Technology” (47582) meets the requirements. No deficiencies were identified. Significant actions have been taken by RTU to address all nine recommendations for the programme in the previous accreditation. The shortcomings presented in this report are ones which RTU may wish to address in the spirit of further enhancing the student experience by building on progress to date.
Currently the programme is implemented as a full-time study programme of one year, totalling 40 CP’s. The awarded degree is the Professional Master Degree in Heat, Gas and Water Engineering Systems. There are two additional forms with extra 20 CP modules or 60 CP forms with a length of 1.5 years for students from other related study programmes.
There is a strong emphasis on practical classes and extensive refurbishment works, currently in progress, will further promote development of the practical component of the study courses and technologies available in the study process.
Many improvements since the last accreditation have been implemented in the programme on foot of the recommendations. Not least is the restructuring in the Daugavpils and Liepaja branches. There has also been a better definition of learning outcomes of the internship and their optimum integration into the study process through academic supervision and appropriate evaluation. The revised outcome statement is a model for other programmes. Notwithstanding this example of quality improvement, the learning outcomes in the programme generally lack the ambition expected at masters degree level. Terms used, such as “are familiar with” and “able to understand” are more suited to the early stages of bachelor degree studies than masters degree programmes. The phraseology of the outcomes has been improved since the previous accreditation but it has yet to fully capture the incremental challenge expected of students as they progress from bachelors to masters degree studies. Equally, some course descriptions need some minor updating in respect of literature references and presentation of text in Latvian and English.
Some modules are taught in English.
The funding available to the study programme, funding sources and the use of funding ensures full implementation of the study process. The insufficient funding is being compensated by the active scientific work of staff and the associated financing from the industry. It leaves an open question if this is beneficial as it ensures strengthening of cooperation with industry or if it gives extra load to the teaching staff. However it may equally be argued that the academic staff in HEI’s worldwide are expected to attract funding to their institutions through high quality research because reliance on state funding alone is not an option.

Strengths:
1. Clarity of the aim of the internship at masters degree level: “To develop ability to make decisions based on the obtained data, to assess alternatives and find the best solution.”
2. The academic staff are supported in developing student-centred practices through continuing

professional development courses on pedagogical developments.
3. Provision of informative materials, availability of library resources.
4. The RTU e-platform ORTUS is functioning well as more e-learning tools are rolled out.
5. Well equipped workshop rooms.
6. Many of the academic staff are members of the Latvian Academy of Sciences, the Institute of Heat, Gas and Water Technology or both. There is an excellent collegiate atmosphere.
7. Extremely low student:staff ratio.

Weaknesses:
1. Due to several reasons, the number of students is decreasing but several factors are outside the control of RTU.
2. The phraseology of learning outcomes does not reflect the incremental higher order of challenge to the students as they step up from a bachelors to a masters degree programme.

Evaluation of the study programme "Heat, Gas and Water Techology"

Evaluation of the study programme:

Good

2.6. Recommendations for the Study Programme "Heat, Gas and Water Techology"

Short-term recommendations

Long-term recommendations

Building on the improvements to date in relation to making the learning outcomes more specific, they should be further refined with phraseology that better reflects the level of the programme and the incremental higher order of learning expected of students as they progress up through the stages of the programme.
Look for opportunities to design interdisciplinary group work between study programmes. Use a course specially for the Study Field, similar to the ‘Vertically Integrated Project’ as a way of getting students of architecture, civil engineering and heat, gas and water technology to work together on important interdisciplinary skills before they receive their degree and go into practice.
Look for opportunities to design modules in the existing study courses or add new courses to develop better skills in presenting students and young professionals work, communicating the principles of profession to other specialists and the general public.

II - "Transportation Engineering" ASSESSMENT

II - "Transportation Engineering" ASSESSMENT

2.1. Indicators Describing the Study Programme

Analysis

2.1.1 The professional Master study programme Transportation Engineering (47582) is a study programme implemented only in Latvian language and it fits and complies with the study field Architecture and construction, with emphasis on construction.

2.1.2 This study programme complies with the State Education standard set in rules of Cabinet of

Ministers No. 510 and is offered through 4 different types:

1) Full-time studies with a total duration of 1 year, and 40 CP which are equivalent to 60 ECTS. The degree awarded is Professional Master Degree in Transportation Engineering. Admission requirements foresee for a professional bachelor degree in transportation engineering.
2) Full-time studies with a total duration of 2 years 6 months, and 100 CP which are equivalent to 150 ECTS. The degree awarded is the Professional Master Degree in Transportation Engineering and the qualification awarded is Civil Engineer. The same admission requirements apply as in option 1.

The study programme aims to prepare students for scientific research activities and further doctoral studies, as well as for teaching at the RTU university or performing practical work at a higher level. Main tasks of the programme are to provide acquisition of theoretical knowledge, skills, and abilities in the field of transportation engineering. The study programme, aims, objectives, learning outcomes and admission requirements are interrelated and can be achieved in time of study programme implementation.

2.1.3 During the period 2017-2021, no changes were made to the programme parameters.

2.1.4 The study programme social and economic justification is based on the presumption that high qualification specialists are necessary, who can design roads, bridges, other transport structures, manage construction projects, maintain these structures in working order, conduct scientific research, and develop new theories and methods of civil engineering (see SAR 3.1.3. p. 207).

Students from this study programme are in high demand in the labor market and employers during the interviews confirmed that, for example, because of the Rail Baltica project, a high number of specialists have to be involved.

Unfortunately student count is decreasing each year, RTU have to re-consider marketing regarding this study programme. Internships are carefully organised with each student given a defined task related to their internship host facilities and specific learning outcomes. A tripartite contract (RTU-student-host) is signed off to comply with the requirements of regulatory enactments. Joint supervision is conducted by nominated supervisors in both the university and the host organisation. The internship is assessed based on reports and a presentation by the student, leading to a grade on a 10-point scale. It could be argued that a pass/fail grade system might be fairer, given the possibility that not all students will have the same opportunities in the internship, with many factors outside of their control.

2.1.5 N/A

Conclusions on this set of criteria, by specifying strengths and weaknesses

The study programme complies with the State Education standard set in rules of Cabinet of Ministers No. 512. Admission requirements are reasonable and provide continuity of the study programme. Study programme graduates are demanded in the labour market. The Experts Group found from the interviews with employers that the students are knowledgeable, but they expressed their need to develop the students in terms of people’s skills, i.e., the ability to de-escalate a situation through proper conversational skills and develop the ability to express themselves in the professional environment.

Strengths:

1. Students from this study programme are in high demand in the labour market.

Weaknesses:
1. The internship is assessed to a value on a 10-point grading scale. It could be argued that a pass/fail grade system might be fairer, given that not all students will have the same opportunities in the internship, with many factors outside of their control.

2.2. The Content of Studies and Implementation Thereof

Analysis

2.2.1 The dual objectives of the professional master study programme in Transportation Engineering (47582) is to provide additional research skills to graduates of the professional bachelors programme in Transportation Engineering and to provide a pathway to the qualification 'PS-184' in 'Civil Engineering' with the Transportation Engineer specialisation to graduates of the bachelors programme in civil engineering. The programme aims are set out clearly in seven statements setting out the expectations of graduate attributes (pp.205). The attributes are formed through modules on general education, specialist topics, humanities, social science and a second foreign language (SAR p.212). Compliance with state education standards is assured through the credit points allocated to pedagogy, psychology, internships and final thesis (SAR, p.214).

The academic staff meet annually, under the guidance of the head of the academic unit, to co-ordinate updating of the modules. The modules are well integrated and aligned with the programme outcomes through a planning map (SAR, Annex 9 and p.215).

The learning outcomes for each module are set out in a comprehensive description template (SAR, Annex 10 and p.215). The descriptors are accessible to all relevant stakeholders through the ORTUS platform. The learning outcomes are adequate but the phraseology (especially the dominant verb in a sentence) could be improved to the benefit of students, those delivering the programmes and all those responsible for challenging the students to achieve their full potential.

The research of the academic staff is highly relevant to practice and is published in the Baltic Journal of Road and Bridge Engineering (SAR, p.213), ensuring the topicality of the curriculum content.

2.2.2 The academic staff and students of the programme regularly publish research findings and present their work at research conferences (SAR, p.217). The awarding of the degree takes account of the student's contribution to advancing the art and science of engineering as evidenced in their final thesis.

2.2.3 The study implementation method is student-centred. Lectures and practical classes combine with a significant amount of independent learning. The progress of students through the programme is monitored at the level of the individual student. Summative assessment is used (SAR, p.220). The internal quality assurance system operates effectively at several management levels. The quality system includes students through module questionnaires and the student self-government involvement in faculty reviews of the programme.

During the experts' meeting with the graduates it was noted the overall programme focus is strongly aimed at teaching material aspects of "bridge construction", and therefore could benefit from additional emphasis on social subjects, focusing on the impact of their work on the society, as well as practical soft skills (communication).

2.2.4 Internships form a part of both the 1-year and the 2 year 6 month programmes. Those doing the longer period of study complete an internship of 32 credit points. Those on the 1-year programme already have prior internship experience from bachelor's study and only do a 6 credit point top up internship (SAR, p.221). The organisation of the internships is highly effective with prior consultation on the specific expertise of the host company to deliver achievable learning outcomes. A tri-party contract (RTU-student-host) is signed off to comply with the requirements of regulatory enactments. Internships are carefully organised on a student-centred case-by-case basis. Joint supervision is conducted by nominated supervisors in both the university and the host organisation. The university supervisor is the Head of Department unless the task is delegated. The internship is assessed based on reports and a presentation by the student. The assessment leads to a grade on a 10-point scale (SAR, p.221).

In an ideal world all students on an internship would be provided with the same level of resources, opportunities and challenge. In practice it needs to be acknowledged that not all host companies can provide an equal level of internship quality as their pers. Thus grading on a 10 point scale might not be fair to students disadvantaged by circumstances outside of their own control. Perhaps a pass/fail grade system would be more appropriate.

2.2.5 Not applicable to this professional master study programme.

2.2.6 The final thesis comprises a research paper for the 1-year students. Those on the longer programme of studies complete a research paper and a transport infrastructure design project (SAR, p.222). The research paper is based on a topical issue in the field such as issues in cable-stayed bridges, turbo roundabouts (SAR p.223). Following approval by an internal review, solutions are presented in public before an Examination Committee. The quality of the final works has been judged to be of a very high standard based on 50% of the grade coming from the examination committee which includes employer representatives.

Conclusions on this set of criteria, by specifying strengths and weaknesses

The dual objectives of the professional master study programme in Transportation Engineering is to provide additional research skills to graduates of the professional bachelors programme in Transportation Engineering and to provide a pathway to the qualification 'PS-184' in 'Civil Engineering' with the Transportation Engineer specialisation to graduates of the bachelors programme in civil engineering. The programme aims are set out clearly. Compliance with state education standards is assured. The modules are well integrated and aligned with the programme outcomes.

The learning outcomes for each module are comprehensive but the phraseology could be improved to reflect the incremental higher order of challenge to the students as they progress up through the stages of the programme.

The research of the academic staff is highly relevant to practice, ensuring the topicality of the curriculum content. The academic staff and students of the programme regularly publish research findings and present their work at research conferences. The awarding of the degree takes account of the student's contribution to advancing the art and science of engineering as evidenced in their final thesis.

The overall programme focus is strongly aimed at teaching material aspects of "bridge construction", and therefore could benefit from additional emphasis on social subjects, focusing on

the impact of their work on the society, as well as practical soft skills (communication).

The study implementation method is student-centred and the progress of students through the programme is monitored at the level of the individual student. Summative assessment is used. The internal quality assurance system operates effectively and the student self-government is involved.

Internships form a part of both the 1-year and the 2 year 6 month programmes. The organisation of the internships is highly effective with prior consultation on the specific expertise of the host company to deliver achievable learning outcomes. A tripartite contract (RTU-student-host) is signed off to comply with the requirements of regulatory enactments. Internships are carefully organised on a student-centred case-by-case basis. Joint supervision is conducted by nominated supervisors in both the university and the host organisation. The internship is assessed based on reports and a presentation by the student. The assessment leads to a grade on a 10-point scale. It could be argued that a pass/fail grade system might be fairer, given the possibility that not all students will have the same opportunities in the internship, with many factors outside of their control.

The final thesis comprises a research paper for the 1-year students. Those on the longer programme of studies complete a research paper and a transport infrastructure design project. The quality of the final works has been judged to be of a very high standard based on 50% of the grade coming from the examination committee which includes employer representatives.

Strengths:
1. Careful alignment of the learning outcomes of each internship with the learning outcomes of selected modules on a student-centred case-by-case basis.

Weaknesses:
1. The phraseology of learning outcomes does not reflect the incremental higher order of challenge to the students as they progress up through the stages of the programme.
2. The internship is assessed to a value on a 10-point grading scale. It could be argued that a pass/fail grade system might be fairer, given that not all students will have the same opportunities in the internship, with many factors outside of their control.

Assessment of the requirement [5] (applicable only to master's or doctoral study programmes)

1 R5 - The study programme for obtaining a master's or doctoral degree is based on the achievements and findings of the respective field of science or field of artistic creation.

Assessment of compliance: Fully compliant

The academic staff and students of the programme regularly publish research findings and present their work at research conferences. The awarding of the degree takes account of the student’s contribution to advancing the art and science of engineering as evidenced in their final thesis.

2.3. Resources and Provision of the Study Programme

Analysis

2.3.1. The study provision, both informative and material, technical, are compliant with the needs of the study programme Transportation Engineering (47582). Informative resources are available from RTU Scientific Library, online academic databases, e-books, e-journals. There is a procedure

developed for convenient ordering of the resources from the library and a procedure for each student to request a limited amount of new materials of special interest (according to the information obtained from site visit meetings with the director of the study programme, academic staff and students).

In addition RTU ORTUS e-platform is a significant tool for student and teaching staff communication. ORTUS provides access for each student to all the data of the courses taken during the studies, and gives understanding of the course structure. Both students and teaching staff highly evaluate ORTUS. As for the material and technical provision, during the tour of facilities the expert group was impressed by the well equipped workshop rooms. Some of the lab rooms were in the process of relocation to newly refurbished facilities in the near future.

Furthermore, substantial investments have been made in research infrastructure, i.e. acquiring testing machines, a drone, high resolution camera (SAR, p.224). There is also a newly established laboratory that is working with 3D concrete printing (3x3m) that is used for research. At the same time it must be noted the experts learned that the equipment in some of the laboratories is not calibrated since it was moved it, which brings up a question of the precision of these instruments.

2.3.2. Not applicable.

2.3.3. The study programme is funded at a sufficient level to ensure full implementation of the study process. The funding and the cost per student has been increasing in the period of the study year 2017/2018 to 2020/2021 (SAR p. 227). However there is always space for improvement. For example as mentioned in the site visit meetings with the director of the study programme funding to attract guest lectures would be helpful. The study programme has the minimum number of students to ensure the profitability of the study programme. According to the annex to SAR On minimal number of students in study programmes there must be at least 19 students in bachelor and masters' levels – which is met and in the 2020/21 was at 44 (SAR, p.209). According to the annex to SAR Funding distribution between the cost items the major part (45%) is used for remuneration, leaving little funding for purchase and modernization of equipment. It leaves a question - is such distribution sustainable in the long term? It shows that the funding is not fully sufficient as such a great part is allocated for first necessities?

Conclusions on this set of criteria, by specifying strengths and weaknesses

The study programme has all the provisions for the implementation of the study programme. Especially at the level of HEI there is a decent provision of material, technical and digital resources, including a concrete 3d printer. At the same time, while the study programme is funded at a sufficient level to ensure full implementation of the study process, it is evident that the purchase and modernization of equipment would benefit from higher funding.

Strengths:
1.Good overall provision of resources, including the excellent library and access to academic databases.

Weaknesses:
1. Funding for equipment acquisition and regular calibration is too low.

Assessment of the requirement [6]

1 R6 - Compliance of the study provision, science provision (if applicable), informative provision (including library), material and technical provision and financial provision with the conditions for the implementation of the study programme and ensuring the achievement of learning outcomes

Assessment of compliance: Fully compliant

The study programme has all the necessary provisions for the implementation of the learning outcomes.

2.4. Teaching Staff

Analysis

2.4.1. It can be said that the number of teachers and their qualifications implemeting the programme Transportation Engineering (47582) meet the legal requirements (Section 39, p.23, Law on Higher Education Institutions, Latvia). In accordance with the quantitative and qualitative indicators (number of teachers involved in realisation of this study programme, number of full-text publications in the journals indexed in SCOPUS and Clarivate Analytics – Figure 4.2.1. characteristics presented in the CVs) - SAR, p.227, 4 professors – Doctors of Science, of the Faculty of Civil Engineering, 1 elected associate professor - Doctor of Science, 7 assistant professors, 1 lecturer, as well as number of published papers, represent the basis for the analysis of the relationship between the academic staff and fulfilment of goals and learning outcomes of this study programme.

Furthermore, the qualifications of this academic staff provide successful fulfilment of the main goal of this study programme: ”...to prepare students for scientific research activities and further doctoral studies, as well as for teaching job at university or practical work” (SAR, p.200), and intended learning outcomes: ”to be able to show a specific basic and specialised knowledge in the Transport and Traffic science discipline,... and a critical understanding of this knowledge... to be able to carry out professional, innovative, or research work, formulate and describe analytically the information, problems and solutions in the field of surface Transport and Infrastructure sub-discipline...” (SAR, p.200).

The ratio permanently employed and elected teachers/students is approximately 1 to 5 (SAR, p.231).

2.4.2.Composition of the teaching staff is presented in Table 4.1.1., p.229. As it can be seen, there are not significant changes comparing data in 2016/2017 academic year and 2020/2021 academic year. On the other hand, the age structure is not shown in the Report. Usually, based on the average period of time needed for reaching the highest academic title, the professors’ estimated age is around 60. This age structure is questionable for assuring a stable realisation of the study programme in the near future (for example, in 5 years from now).

In addition, the measures undertaken for providing the sustainable composition of academic staff regarding quality in implementation of this study programme are the same as those who were mentioned in the analysis of previous study programmes.

2.4.3. N/A

2.4.4. The evaluation of this criteria is based on the analysis of participation of teachers in various fields of their work. As it can be seen from the SAR, (p.228), the composition of academic staff is almost the same as it was in the study programme of Transportation Engineering, (code 42582).

Consequently, the conclusion regarding fulfilment of criteria presented in this chapter, 2.4.4. is also the same. In order to support this conclusion, it should be emphasized that the additional materials provided by RTU which are available on e-platform are very useful in the evaluation process. Namely, it's about annexes which provide detailed data regarding: various activities in teaching and learning, scientific research work, (title of the publication, journal where it is published, year of publishing, amount of citations), artistic activities, (achievement of the activity, realization period and place, financing), creation of patents, (patents and licence of teaching staff). Overall the academic staff is involved in the processes of academic research. According to available information, the academic staff are continuously involved in producing research outputs and artistic achievements, and they have taken part in publications and/or relevant practical work experience (Study Field appendixes 2.3 and 2.4, as well as SAR p.226-229).

2.4.5. The already mentioned mechanisms (in analysis of previous study programmes), for mutual cooperation of teachers in the implementation of study programmes, are put in place in this programme, too. Therefore, reviewing and updating of study courses content is directed towards creation of learning outcomes in line with the science development and professionals' requirements. Results of the students' survey, as well as, the opinion of graduates and employers are a good basis for study courses development (and study programme as a whole), in the required direction. Bearing in mind the discussions with mentioned external stakeholders (meetings – 17th of February 2022), there is a need for a higher level of their involvement in organised regular surveys.

Conclusions on this set of criteria, by indicating strengths and weaknesses

Comparison of the facts presented by members of the group responsible for the preparation of the SAR, as well as the requirements in the frame of the legal acts, leads to the conclusion that the number and qualifications of teaching staff involved in the realisation of this study programme meet the legal demands.

Moreover, professional characteristics of teachers provide successful realisation of this study programme, through fulfilment of the aims and learning outcomes.

Data regarding the number of teachers and their academic positions, are presented in the SAR (p.229). On the other side, the age structure of the academic staff (as an important indicator for the teachers' composition) is missing.

High level of cooperation directed towards reviewing and updating study courses description, among members of academic staff, is observed. The opinion of other stakeholders in higher education processes has to be included to a greater extent in mentioned processes.

Detailed analysis of the SAR and materials on e-platform, leads to the conclusion that teachers who participate in delivery of this study programme follow and meet the requirements of criteria 2.4.4.

Strengths:
1. The structure of the teaching staff ensures programme's sustainability in terms of programme content delivery.

Weaknessess:
1. The way of presenting the information that is important for proper and overall assessment of working in certain segments of study programme (age structure of the academic staff).

2. Low level of involvement of external stakeholders (graduates, employers) in regular surveys.

Assessment of the requirement [7]

1 R7 - Compliance of the qualification of the academic staff and visiting professors, visiting associate professors, visiting docents, visiting lecturers and visiting assistants with the conditions for the implementation of the study programme and the requirements set out in the respective regulatory enactments.

Assessment of compliance: Fully compliant

Law on Higher Education Institutions Latvia, Section 39,p.23 Academic Staff of Vocational Study Programmes

2.5. Assessment of the Compliance

Requirements

1 1 - The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard

Assessment of compliance: Fully compliant

Study programme Transportation Engineering (47582) complies with Professional Higher Education Standard (Cabinet of Ministers No. 512) Study programme total volume 40 CP in case of option 1, or 100 CP in case of option 2, of which study courses that ensure in-depth acquisition of the latest developments in theory and practice 12 CP, Research work, creative work, design work and management study courses 6CP, Practical Placement 6 CP in case of option 1 or 32 CP in case of option 2, Master's thesis 20 CP in case of option 1, Master's thesis 26 in case of option 2.
Compliance with the study programme with the State Education Standard Annex No 6 RBCSO

2 2 - The study programme complies with a valid professional standard or the requirements for the professional qualification (if there is no professional standard required for the relevant occupation) provided if the completion of the study programme leads to a professional qualification (if applicable)

Assessment of compliance: Fully compliant

There are professional standard requirements for “The Civil Engineer”, this standard is brand new, and full compliance of the study courses has been mapped with the standard. See annex 7. Compliance with the Professional Standard (1).

3 3 - 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 561 , Paragraph two and Section 562 , Paragraph two of the Law on Higher Education Institutions.

Assessment of compliance: Partially compliant

Study course descriptions are well prepared and they contain all basic knowledge on the length, syllabus, learning outcomes, and evaluation methods in the study course. Nevertheless, compulsory literature should be revised and updated, because some of the literature is from 2000s'. To create even better study course descriptions in the future RTU can consider adding a table which includes on what lecture, lesson what type of knowledge check will be held, and add more detailed descriptions on what will be learned in each lecture, lesson. Some descriptions contain literature in Russian See annex: 10_ENG

4 4 - The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure according to which state recognised documents of higher education are issued.

Assessment of compliance: Fully compliant

Diploma issued complies with the state legislation. See annex of the study programme: Diploma example RBGT0 with attachment 1 un 2_5 year studies.pdf

5 5 - 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 Higher Education Institutions.

Assessment of compliance: Not relevant

Not applicable

6 6 - 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 Higher Education Institutions.

Assessment of compliance: Not relevant

Not applicable

7 7 - 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 (if applicable).

Assessment of compliance: Not relevant

Not applicable

8 8 - 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

Academic staff has sufficient latvian language knowledge for implementing study courses, see annex : Apliecinājums - valsts valodas prasme.

9 9 - 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 (if applicable).

Assessment of compliance: Not relevant

Not applicable

10 10 - The sample of the study agreement complies with the mandatory provisions to be included in the study agreement.

Assessment of compliance: Fully compliant

Study agreements include all necessary parts set in legislation. See the annex: Studiju līgumi.

11 11 - The higher education institution / college has provided confirmation that students will be provided with opportunities to continue their education in another study programme or another higher education institution or college (agreement with another accredited higher education institution or college) if the implementation of the study programme is terminated.

Assessment of compliance: Fully compliant

The RTU has an agreement with LLU (Latvia University of Life Sciences and Technologies) that in case the study programme will be terminated students will be provided with the option to continue studies in LLU. See file Agreement LLU and RTU. RTU in future should provide information about exactly which study programme students can continue their studies. This information also would be beneficial for the students.

12 12 - The higher education institution / college has provided confirmation that students are guaranteed compensation for losses if the study programme is not accredited or the study programme's license is revoked due to the actions (actions or omissions) of the higher education institution or college and the student does not wish to continue studies in another study programme.

Assessment of compliance: Fully compliant

RTU confirms that they will compensate losses for students in case of termination of the study programme. See annex: Confirmation on compensation for losses

13 13 - The joint study programmes comply with the requirements prescribed in Section 55.(1), Paragraphs one, two, and seven of the Law on Higher Education Institutions (if applicable)

Assessment of compliance: Fully compliant

Not applicable

14 14 - Compliance with the requirements specified in other regulatory enactments that apply to the study programme being assessed (if applicable)

Assessment of compliance: Fully compliant

RTU has indicated that this study programme complies with Civil Engineering law (Pursuant to Article 13 of the Civil Engineering Law). See annex: Compliance of the study programme with the specific regulatory framework of the relevant sector.

Assessment of the requirement [8]

1 R8 - Compliance of the study programme with the requirements set forth in the Law on Higher Education Institutions and other regulatory enactments.

Assessment of compliance: Fully compliant

Annexes to the SAR

General conclusions about the study programme, indicating the most important strengths and weaknesses of the study programme

It is concluded that the professional master study programme "Transportation Engineering (47582)" meets the requirements. No major deficiencies were identified. The shortcomings presented in this report are ones which RTU may wish to address in the spirit of further enhancing the student experience by building on progress to date.

Currently the programme is implemented in 2 different length full time forms. (the division and specifics in 2.1.2. - Indicators Describing the Study Programme). The high importance of laboratory-

based learning cannot be underestimated in engineering programmes.

The learning outcomes have been improved since the previous accreditation and set out the knowledge, skills and competences to be achieved. Nevertheless, the phraseology could be improved to reflect the higher order of learning expected of the students as they progress through the stages of the programme.

The internships are very well organised and jointly supervised. It is carefully organised with each student given a defined task related to their internship host facilities and specific learning outcomes.

The funding available to the study programme, funding sources and the use of funding ensures full implementation of the study process. However there is always space for improvement if further funding is provided. One of the priorities would be extra funding for equipment acquisition and regular calibration.

Strengths:
1. Students are highly evaluated among employers and in high demand.
2. Careful alignment of the learning outcomes of each internship with the learning outcomes of selected modules on a student-centred case-by-case basis.
3. Good overall provision of resources, including the excellent library and access to academic databases.

Weaknesses:
1. The phraseology of learning outcomes does not reflect the incremental higher order of challenge to the students as they progress up through the stages of the programme.
2. Funding for equipment acquisition and regular calibration is too low.
3. Low level of involvement of external stakeholders (graduates, employers) in regular surveys.
4. Presentation and analysis of all relevant data for assessment of processes in the Institution (age structure of the academic staff).

Evaluation of the study programme "Transportation Engineering"

Evaluation of the study programme:

Good

2.6. Recommendations for the Study Programme "Transportation Engineering"

Short-term recommendations

Presentation and analysis of all relevant data for assessment of processes in the Institution(age structure of the academic staff)
Increasing the level of external stakeholders (graduates, employers) involvement in regular surveys throughout explanation of the importance of the surveys and proving that their opinion makes difference and is taken into consideration when the programme is reviewed.

Long-term recommendations

Create study courses or joint projects where students can develop more soft skills. They also have to learn how to communicate with all involved parties and manage public discussions not only to be great in engineering part.
Building on the improvements to date in relation to making the learning outcomes more specific, they should be further refined with phraseology that better reflects the level of the programme and the incremental higher order of learning expected of students as they progress up through the stages of the programme.
Consideration should be given to assessing the internship as a pass/fail module rather than a value on a 10-point grading scale, given that not all students will have the same opportunities in the internship, with many factors outside of their control

II - "Architecture" ASSESSMENT

II - "Architecture" ASSESSMENT

2.1. Indicators Describing the Study Programme

Analysis

2.1.1. Doctoral study programme Architecture (51581) is a full time study programme with a total length of 4 years and can be implemented in Latvian and English languages. Doctoral study programme Architecture name and contents fits in and complies with study field Architecture and Construction.

2.1.2. Total amount of CP in the Doctoral study programme Architecture (51581) is 192 CP which equals 288 ECTS. Study programme is not regulated with any State regulated education standards, but complies with the Law on Higher Education Institutions. Admission requirements are Master degree in the engineering science of Architecture, or comparable education, level of English language proficiency at least B2 for English study programme. These admission requirements are reasonable and provide continuity of the Architecture study programme from Master level studies to Doctoral level. Degree awarded is “Doctor of Science (Ph.D.) in Music, Visual Arts and Architecture.” Study programme aims to complete previously acquired knowledge of Architecture and implement it in research and teaching activities. Study programme tasks are to develop understanding of the Architectures interactions with other related fields and for students to develop independent research work, complex experiments. The study programme, aims, objectives, learning outcomes and admission requirements are interrelated and can be achieved in time of study programme implementation.

2.1.3. During the reporting period, no changes to the parameters of the doctoral study programme “Architecture” have been made.

2.1.4. Programme graduates provide renewal of academic staff in the area of Architecture and conduct different research projects in both - public and private sectors. To raise awareness and highlight the Architectures importance and interactions with society, carry out new research in the field new graduates are needed. Graduates of the study programme are employed in the field or continue their scientific work. (SAR 3.1.3. p.269). PhD holders in Architecture are needed for renewal of academic staff, are demanded in industry to carry out research work and give expertise in Architecture related fields - information obtained from the site visit. During the previous accreditation period, no students were admitted to the English language stream. Each year there are

1-2 students admitted to the programme in state funded places and each academic year there has been one graduate.

2.1.5. N/A

Conclusions on this set of criteria, by specifying strengths and weaknesses

Study programme complies with the Law on Higher Education Institutions. Study programme name, degree, qualification awarded are also interrelated. Study programme, aims, objectives, learning outcomes and admission requirements compliments each other and complies within the study field. Graduates of this programme are demanded in industry and in academic environments. Student count has not significantly changed since previous accreditation. Unfortunately no students have chosen an English study programme, this might be an indicator for poor advertising of the study programme.

Strengths:
1.Study programme prepared good PhD level students, who mostly stay in academic environments and continue to teach other students.

Weaknesses:
1. During the previous accreditation period there have not been enrolled students in the English flow.

2.2. The Content of Studies and Implementation Thereof

Analysis

2.2.1. The doctoral programme Architecture (51581) is based on scientific research, and its study content is structured to accommodate the possibility of planning the contents in accordance with research in specific fields. Different from the two other programmes of the sub-direction “Architecture” at the HEI, the contents of the doctoral programme are geared towards the goal “to advance the knowledge and skills of students necessary for research in the fields related to art of environment design” (SAR, p.271)

The needs of the scientific discourse are met by a curriculum (doctoral programme “Architecture”, appendix 3.2) that covers the requirements set in all binding provisions. According to the meetings with the academic staff and the director of the programme, the revision of study content takes place on an annual basis and benefits from the research outcomes of the academic staff (SAR, p.272-273). The programme is offered in full time or part time, and taught either in English or Latvian. The curriculum consists of 288 ECTS, including electives for further specialisation in particular areas of the scientific field, which are offered in parallel to the scientific study.

2.2.2. The awarding of a doctoral degree (PhD) in the field of humanities and artistic sciences “Music, Visual Art and Architecture” is based on the relevant findings and achievements in the field of architecture. According to the experts’ meeting with the academic staff and graduates, the content of the programme meets the needs of the scientific trends and labour market, which in the case of this study programme is primarily situated within the scientific field. The dissertation responds to well defined and relevant topics, and resonates with the research fields of the academic staff, outlined in SAR p.271. At the same time, the research fields and thesis topics relate much less to broader developments and discussions in the field beyond the immediate practical concerns in Latvia, which makes the program less attractive to both international teaching staff and students.

2.2.3. The study implementation is student centered and tailored to particular research interests developed by the student as noted in SAR p. 273 and the information obtained in experts' meeting with the graduate of a programme.

2.2.4. N/A

2.2.5. The promotion procedure for PhD students is defined by "Regulations on Promotion Councils and Promotion at RTU." The promotion work may take predefined forms, such as doctoral thesis, a series of publications in the field, or a monograph, and the studies are completed with passing the relevant examinations, and divided in three stages followed by promotion defense, followed by the fourth stage which is the promotion of the work (SAR, p.275). In meeting with a graduate of the programme, the experts noted that the scientific work tends to generate a multitude of further scientific research beyond the dissertation.

2.2.6. According to SAR, p.275, the thesis topics are chosen referring to relevant global tendencies and developments in the industry. They are relevant to the field, and upon presentation, the theses are evaluated in terms of their compliance to the relevant requirements.

Conclusions on this set of criteria, by specifying strengths and weaknesses

Overall the content of the study programme meets all the relevant regulations; it is well composed and allows the students to meet the study objectives and produce research relevant to the field and developments in Latvia and beyond. On one hand the research produced is topical and corresponds to the latest developments in the field in Latvia. On the other, the experts noted that the research fields and thesis topics very little broader developments and discussions in the field beyond developments in Latvia. This makes the program less attractive to both international teaching staff and students, especially since there are several doctoral study programmes in architecture within the EU that generate research output beyond topics oriented to the local context or narrow definitions of architecture field.

Strengths:
1. Topics of thesis related to latest developments in the field and their impact on development processes in Latvia

Weaknesses:
1. The topics of thesis are less focused on processes outside Latvia and broader theoretical and historical currents.

Assessment of the requirement [5] (applicable only to master's or doctoral study programmes)

1 R5 - The study programme for obtaining a master's or doctoral degree is based on the achievements and findings of the respective field of science or field of artistic creation.

Assessment of compliance: Fully compliant

In principle, doctoral student research topics are relevant to the advance of knowledge in the study field and innovation in industry within the Latvian context. At the same time, there is a space for improvement in terms of critically with history and theory, as well as transdisciplinary fields, i.e. humanities. SAR, p.271-275 and doctoral programme "Architecture", appendix 3.2

2.3. Resources and Provision of the Study Programme

Analysis

2.3.1. The study provision, both informative and material, technical, are compliant for the study programme Architecture (51581). Informative resources are available from RTU Scientific Library, online databases, e-books, e-journals, Faculty of Architecture also has its own library and resource room (SAR p. 276). There is a procedure developed for convenient ordering of the resources from the library and a procedure for each student to request a limited amount of new materials of special interest (according to info from site visit meetings with the director of the study programmes, academic staff and students). In addition RTU ORTUS e-platform is a significant tool for student and teaching staff communication. ORTUS provides access for each student to all the data of the courses taken during the studies, and gives understanding of the course structure. Both students and teaching staff highly evaluate ORTUS. As for the material and technical provision, during the tour of facilities expert group was impressed by the well equipped workshop rooms for wood and carpentry, as well as scale modelling workshop. Each student is given 24/7 access to a workplace in the design workshop.

2.3.2. There is close cooperation, joint activities, research, seminars and conferences organised together with higher education institutions of Arts and Technology from Baltic states Estonia and Lithuania. Not so regular, still there is ongoing cooperation with Scandinavian countries and international research institutions. (SAR p. 276).

2.3.3. The funding available to the study programme, funding sources and the use of funding ensures full implementation of the study process. However there is always space for improvement. The funding and the cost per student has been increasing in the period of the study year 2017/2018 to 2020/2021 (SAR p. 277). According to the annex to SAR Funding distribution between the cost items the major part (46%) is used for remuneration, leaving for example the position of purchase of books and magazines with only 3% and business trip expenses at 0%. It leaves a question - is such distribution sustainable in the long term as such a great part is allocated for first necessities? The study programme has the minimum number of students to ensure the profitability of the study programme. Each year there are 1-2 students admitted to the programme in state funded places and each academic year there has been one graduate (in the Latvian language programme). According to the annex to SAR On minimal number of students in study programmes it is sufficient as this is a case of study programme that is strategically important for RTU and the state, thus RTU also ensures the implementation of study programmes with smaller number of students than in general in doctoral studies - at least 10 students for full-time and 8 students for part-time.

Conclusions on this set of criteria, by specifying strengths and weaknesses

Overall resources and provision of the study programme are compliant for the study programme. There is a decent provision of informative resources, a specialized library for the needs of the study field. Good material and technical provision, well equipped workshop rooms. Access to both informative and technical resources is ensured convenient. There is cooperation, joint activities, research, seminars and conferences present, still, it is evident that the study programme would benefit from higher funding or distribution of funding providing a greater percentage for positions for more international cooperation.

Strengths:
1. Provision of informative materials, availability of library resources.
2. Well functioning RTU e-platform ORTUS.
3. Close cooperation with higher education institutions of Arts and Technology from Baltic states.
4. Ongoing cooperation with Scandinavian countries and international research institutions

Weaknesses:
1. The funding available to the study programme, the distribution of it.
2. Number of students does not reach the standard minimum.

Assessment of the requirement [6]

1 R6 - Compliance of the study provision, science provision (if applicable), informative provision (including library), material and technical provision and financial provision with the conditions for the implementation of the study programme and ensuring the achievement of learning outcomes

Assessment of compliance: Fully compliant

SAR p. 276-277. The study programme has all the necessary provisions for the implementation of the learning outcomes.

2.4. Teaching Staff

Analysis

2.4.1. The qualification of academic staff enables the achievement of learning outcomes and meets all the relevant study requirements and regulations of the doctoral programme Architecture (51581). The implementation of the doctoral study programme involves full time elected academic staff personnel with relevant research qualification (Study Field appendixes 2.3 and 2.4, SAR, p.278). The implementation of the doctoral study programme involves over 10 members of academic staff and visiting lecturers (SAR, p.280). According to available information, there are no members who contribute to incoming long term academic mobility.

2.4.2. The changes in the composition of the teaching staff are being planned skillfully and well in advance. During the reporting period 2 doctors of science joined the study program. During meetings with the program director, academic staff and alumni all confirmed that there is close and long lasting cooperation between faculty and alumni. Thus ensuring gradual renewal of staff. There is a good practice that a number of PhD alumni stay as new academic staff members. There is close cooperation with Latvian Architects Union which positively affects the quality of the implementation of the study programme and the compliance of the study programme with the requirements specified in regulatory enactments. The doctors of science mentioned in SAR p. 280 are good examples of cooperation mentioned above.

2.4.3. The academic staff are continuously involved in producing research outputs. Their scientific publications (over 40 articles per year according to SAR p.281-291) and artistic achievements (Study Field appendixes 2.3 and 2.4.) contribute to a high quality doctoral programme with a broad set of knowledge and relevant research expertise. It must be noted that during the meeting with the academic staff, the experts noted a high degree of enthusiasm and motivation among the staff members.

2.4.4. The academic staff is actively involved in producing research output, including peer reviewed editions domestically and internationally. According to available information, the academic staff are continuously involved in producing research outputs and artistic achievements, and they have taken part in publications and/or relevant practical work experience (Study Field appendixes 2.3 and 2.4, as well as SAR p.281-291).

2.4.5. According to experts' meetings with both the director of the study programme and the academic staff, a mechanism for mutual cooperation is established among the staff both on

systemic level and by providing spaces for informal communication. Primarily it is articulated via regular staff meetings and coordination of study content and necessary revisions, as well as didactic development opportunities provided to staff.

Conclusions on this set of criteria, by indicating strengths and weaknesses

Overall the staff of the programme is fully qualified in regard to the applicable requirements. The experts noted a high degree of motivation and interest in the study programme. Due to limited resources, long-term staff mobility both inwards and outwards remains a challenge, and the efforts by the study programme to attract international staff is challenging.

Strengths
1. Academic staff active in multiple relevant scientific fields, quantifiable research output

Weaknesses
2. No incoming international research staff beyond short duration visits

Assessment of the requirement [7]

1 R7 - Compliance of the qualification of the academic staff and visiting professors, visiting associate professors, visiting docents, visiting lecturers and visiting assistants with the conditions for the implementation of the study programme and the requirements set out in the respective regulatory enactments.

Assessment of compliance: Fully compliant

Study Field appendixes 2.3 and 2.4, SAR, p.278-280

2.5. Assessment of the Compliance

Requirements

1 1 - The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard

Assessment of compliance: Not relevant

Not applicable

2 2 - The study programme complies with a valid professional standard or the requirements for the professional qualification (if there is no professional standard required for the relevant occupation) provided if the completion of the study programme leads to a professional qualification (if applicable)

Assessment of compliance: Not relevant

Not applicable.

3 3 - 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 561 , Paragraph two and Section 562 , Paragraph two of the Law on Higher Education Institutions.

Assessment of compliance: Fully compliant

Study course descriptions are well prepared and they contain all basic knowledge on the length, syllabus, learning outcomes, and evaluation methods in the study course. Since the programme is held also in English, course descriptions are available also in English.

4 4 - The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure according to which state recognised documents of higher education are issued.

Assessment of compliance: Fully compliant

Diploma issued complies with the state legislation. See annex RADA_dipl_LV.

5 5 - 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 Higher Education Institutions.

Assessment of compliance: Fully compliant

There are at least 5 PhD holders implemented in study programme. See annex: Apliecinājums - AL 55. pants par prof. skaitu akadēmiskās programmememās and Apliecinājums - LZP eksperti doktora programmememā.

6 6 - 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 Higher Education Institutions.

Assessment of compliance: Fully compliant

All requirements are met, see AIP letter : Nr_83_RTU_Dokt_Arhitekt_par+250+stud.

7 7 - 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 (if applicable).

Assessment of compliance: Fully compliant

Currently there are 4 prof. that are also experts in Latvian science council. See annex. :Apliecinājums - LZP eksperti doktora programmā.

8 8 - 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

Academic staff has sufficient Latvian language knowledge for implementing study courses, see annex : Apliecinājums - valsts valodas prasme.

9 9 - 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 (if applicable).

Assessment of compliance: Fully compliant

Academic staff has sufficient English language knowledge for implementing study courses. Confirmation available in annex: Apliecinājums - svešvalodu prasme.

10 10 - The sample of the study agreement complies with the mandatory provisions to be included in the study agreement.

Assessment of compliance: Fully compliant

Study agreements include all necessary parts set in legislation. See the annex: Studiju līgumi.

11 11 - The higher education institution / college has provided confirmation that students will be provided with opportunities to continue their education in another study programme or another higher education institution or college (agreement with another accredited higher education institution or college) if the implementation of the study programme is terminated.

Assessment of compliance: Fully compliant

The RTU has an agreement with LLU (Latvia University of Life Sciences and Technologies) that in case the study programme will be terminated students will be provided with option to continue studies in LLU. See file VienosanÉs_LLU un RTU_Arhitektura_buvnieciba.RTU in future should provide information about exactly which study programme students can continue their studies. This information also would be beneficial for the students.

12 12 - The higher education institution / college has provided confirmation that students are guaranteed compensation for losses if the study programme is not accredited or the study programme’s license is revoked due to the actions (actions or omissions) of the higher education institution or college and the student does not wish to continue studies in another study programme.

Assessment of compliance: Fully compliant

RTU confirms that they will compensate losses for students in case of termination of the study programme. See annex: Apliecinājums - par zaudējumu kompensāciju.

13 13 - The joint study programmes comply with the requirements prescribed in Section 55.(1), Paragraphs one, two, and seven of the Law on Higher Education Institutions (if applicable)

Assessment of compliance: Not relevant

Not applicable

14 14 - Compliance with the requirements specified in other regulatory enactments that apply to the study programme being assessed (if applicable)

Assessment of compliance: Not relevant

Not applicable

Assessment of the requirement [8]

1 R8 - Compliance of the study programme with the requirements set forth in the Law on Higher Education Institutions and other regulatory enactments.

Assessment of compliance: Fully compliant

All regulatory requirements are met and fulfilled.

General conclusions about the study programme, indicating the most important strengths and weaknesses of the study programme

Overall the doctoral programme in architecture fulfills all the requirements. Its curriculum is flexible to accommodate the specific research needs of each project. The research output corresponds to the latest developments in the field and their impact on development processes in Latvia, but much less to themes beyond the immediate material conditions in Latvia. Only insignificant shortcomings have been identified, most notably the internationalization in terms of staff and students. Moreover, no students were enrolled in the English stream of the programme.

Evaluation of the study programme "Architecture"

Evaluation of the study programme:

Good

2.6. Recommendations for the Study Programme "Architecture"

Short-term recommendations

Reconsider the need for the English programme, since there were no students, and the international competitiveness of the program is uncertain, especially without international staff.

Long-term recommendations

Develop sustainable mechanisms of attracting long term incoming international academic staff
Explore the possibilities to connecting the research fields to broader discussions in the architecture field beyond the immediate material conditions in Latvia.
In study content, place more emphasis on critical engagement with history and theory, as well as transdisciplinary fields, such as humanities.

II - "Civil Engineering" ASSESSMENT

II - "Civil Engineering" ASSESSMENT

2.1. Indicators Describing the Study Programme

Analysis

2.1.1. The doctoral study programme Civil Engineering (51582), was licensed with No 04051-44 and approved at the meeting of RTU Senate on 25 March, 1996, Minutes No 410. The updated study programme was approved at the meeting of RTU Senate on 26 March, 2001, Minutes No 457; at the meeting on 2 June, 2003, Minutes No 478, at the meeting on 28 June, 2004, Minutes No 488, and accredited by the decision of the Study Accreditation Commission of the LR Ministry of Education and Science of 29 May, 2017. The programme is found to be in compliance with the study field.

2.1.2. The quality of learning outcomes is provided by the system of cross-compliance of the enrolment requirements with the study aims and tasks, the general principles are defined in RTU Regulation on Doctoral Studies.
The study programme’s duration is 4 years and has 192 credit points. Through their PhD studies, students develop competencies through conducting scientific research and providing scientific solutions in various fields related to civil engineering new technologies.
The PhD study programme is implemented according to the Law on Higher Educational institutions of 2 November 1995, the Law on Scientific Activity of 19 May 2005, and the Law on Education of 29 October 1998, as well as in accordance with the Cabinet Regulations No.1001 "On the Procedure and Criteria for Awarding Doctoral Scientific Degree” of 27 December 2005, RTU Constitution, RTU Senate decisions and RTU regulations on the Doctoral studies. It is also to following the Cabinet of Ministers 23.01.2018. regulations no. 49 Regulations on Latvian Science Sectors and Sub-Sectors. The admission to the programme foresees the students to have a master’s degree. The study programme is offered in Latvian and English languages.
The study programme’s aim is to prepare highly qualified specialists that will be able to perform research activities, preparation of academic staff for teaching at university level in the area of civil engineering and preparation of scientists for independent undertaking and supervision of research

projects (see planned learning outcomes in SAR). The awarded academic degree is PhD. The application of the study programme in both English and Latvian languages is justifiable. In addition, the admission requirement of future candidates to have a masters degree is also justifiable in achieving the learning outcomes of this programme.

2.1.3. The title of the awarded degree was changed during the reporting period. Amendments to the Cabinet regulations No.1001 of 27 December, 2005 “The Procedure and Criteria for Awarding of a Doctoral Degree” stipulate that “The degrees with the titles specified in the decision on accreditation of relevant Doctoral programmes before 17 August 2018” can be awarded until 31 December 2019.” (Clause 41). From 1 January 2020 the awarded academic degree is PhD”.

2.1.4. The economic and social substantiation of the study programme is based on industry surveys, which are performed on an annual basis by the Ministry of Economics. The aim of these surveys is to follow up on the development trends of the civil engineering field to identify specific factors that obstruct the development of the industry. According to the results from these surveys, it was found that the study programme is required to further support the development of the industry and in general the Latvian economy. A total of 7 doctoral thesis were defended during the reporting period, which is found to be sufficient for the size of the study programme. The numbers of doctoral students were found to follow the same decreasing trend as before.

2.1.5. N/A

Conclusions on this set of criteria, by specifying strengths and weaknesses

The Doctoral study programme aims to develop scientists that are also prepared to teach at the university level. The aims are clearly structured, while the learning outcomes are in line with the strategic aims of the RTU. The duration of 4 years is found to be realistic and the number of Doctoral theses within the reporting period was sufficient.

Strength:
There is a healthy doctoral thesis output that helps increase the volume and quality of research outcomes at the RTU.

Weakness:
The numbers of students since 2018/2019 indicate a steady decrease that has to be addressed

2.2. The Content of Studies and Implementation Thereof

Analysis

2.2.1. The objective of the programme Civil Engineering (51582) is to produce graduates at doctoral level in civil and transport engineering in five subfields of specialisation. These include water supply and treatment, sustainable transport infrastructure, energy networks in buildings, advances in geotechnics and structures (SAR, p.341). It may be seen therefore that these specialisations address topics of concern, especially in the context of the United Nations Sustainable Development Goals, ensuring topicality of the content.
The 192 CP programme includes 42 CP’s of modules additional to the research thesis. Half of the additional modules are specialist to the student’s chosen field of expertise.
There is just one programme aim which is supported by nine learning outcomes (SAR, p.335). Given that there is only one programme outcome it is meaningless to map individual learning outcomes to individual programme outcomes. The programme aims need to be broken down into several distinct

programme outcomes to which the nine learning outcomes could more meaningfully be mapped so that their continued interconnectivity and complementarity is more easily managed .
The learning outcomes are somewhat generic and lack precision (SAR, p.336). This makes assessment of achieved learning outcomes difficult. For example, the outcome “is able to take responsibility for ethical aspects of their research activities” is less impactful than a statement such as “act ethically in the creation of research data and demonstrate integrity in the publication of research as author or co-author”.
There is a strong market for the graduates through (i) the number of retirements of highly qualified academics in Latvian universities; (ii) the changing needs of industry where innovation is increasingly valued and (iii) the need for experts in state regulatory bodies such as those responsible for environmental protection and sustainable infrastructure development (SAR, p.337).

2.2.2. The awarding of a degree is contingent on the researcher publishing at least one peer reviewed publication in a SCOPUS or Web of Science indexed journal, with Impact Factor (SAR, p.341).

2.2.3. The programme of study is implemented through a combination of lecture-based modules and independent research. The taught modules include advanced topics on numerical methods, vibration damping, fracture mechanics and research methodology, (SAR, p.343). The student-centred approach is reinforced by involvement of the Ph.D. students in the work of the Faculty of Civil Engineering Council. Feedback from students, collectively and individually is used for programme quality improvement and case-by-case tutoring of students by their research supervisors.

2.2.4. Internship does not form a part of the programme.

2.2.5 . The process of promotion operates through one of 19 Promotion Councils at RTU. Civil Engineering is one of the accredited scientific domains across the wider study field of engineering. The students work through a four-stage process to gain acceptance for preparing a thesis. Firstly, they must successfully complete prescribed modules. Secondly, they must prepare research goals and evidence of their research achievement towards these goals. Thirdly, they must present their research work to the Promotion Council for Civil Engineering and outline the thesis to be defended (p.347). Finally, the student defends the thesis.

2.2.6. The Expert Group reviewed seven topics at doctoral level in the reported period of this review. All topics are relevant to the advance of knowledge in the study field and innovation in industry (SAR p.338, 339).

Conclusions on this set of criteria, by specifying strengths and weaknesses

The objective of the programme is to produce graduates at doctoral level in civil and transport engineering addressing topics of concern, not least in the context of the UN SDG’s. There is one programme aim, supported by nine learning outcomes. The programme aim needs to be broken down into several distinct programme outcomes to which the nine learning outcomes could more meaningfully be mapped.
The learning outcomes lack precision. This makes assessment of achieved learning outcomes difficult.
There is a strong market for the graduates, primarily due to impending retirements of highly qualified academics in Latvian universities but also in industry and state regulatory bodies.
The awarding of a degree is contingent on the researcher publishing at least one peer reviewed publication in a SCOPUS or Web of Science indexed journal, with Impact Factor.

The programme of study is implemented through a combination of lecture-based modules and independent research. A student-centred approach is reinforced by the involvement of Ph.D. students in the work of the Faculty of Civil Engineering Council.
Regarding promotion, the students work through a four-stage process to gain acceptance for preparation and defence of a thesis.
Doctoral student research topics are relevant to the advance of knowledge in the study field and innovation in industry.

Strengths:
No exceptional points to comment on.

Weaknesses:
1. The programme aim is too all-encompassing which hinders mapping distinct module learning outcomes to programme outcomes.
2. The phraseology of learning outcomes does not reflect the incremental higher order of challenge to the students as they progress up through the stages of the programme.

Assessment of the requirement [5] (applicable only to master's or doctoral study programmes)

1 R5 - The study programme for obtaining a master's or doctoral degree is based on the achievements and findings of the respective field of science or field of artistic creation.

Assessment of compliance: Fully compliant

Doctoral student research topics are relevant to the advance of knowledge in the study field and innovation in industry.

2.3. Resources and Provision of the Study Programme

Analysis

2.3.1. For the programme Civil Engineering (51582), RTU funding from the basic state budget is made up of the study base financing corresponding to the list of study programmes and the number of students; it is used to cover such expenses as utilities, taxes, infrastructure maintenance (including data for the Student and Graduate Register), purchase of equipment and supplies, staff remuneration, and funding for research activities.

Analysing the financing procedure of the study programmes and the study directions at RTU as a whole, it can be seen that the state basic budget and local fee-paying student funding, in the long run, are determined taking into account the basic principles established by the state.

The library, material and technical provision and financial provision correspond to specific features and conditions for the implementation of the study programme, create preconditions for achieving study results and indicate the possibility to ensure a quality study process.

In previous years, doctoral students have mastered modern teaching methods using the following modern modelling and structural calculation computer programs. In addition to the master's program, doctoral students acquire finite element and physical process modelling software ANSYS, NASTRAN, LS-DYNA, ABAQUS.
During the doctoral study period, students have the opportunity to use the equipment purchased at RTU for research and processing of results. Specifically for this study program, the university has

purchased equipment for monitoring, measuring and testing building structures.
The ORTUS platform has well-organized teaching materials, literature, curriculum and correspondence with teachers and trainers. Learning outcomes are good.
The measuring instruments purchased by the university and used in the training process are not fully calibrated. Their readings are not completely verifiable. During the test procedure, some measuring equipment is not working or is not ready for operation.

2.3.2. The doctoral study program, the provision of studies and science, including the resources provided for cooperation with other scientific institutions and universities in the field of exchange of information and research results, meet the requirements of the paragraph in order to create preconditions for the implementation of the doctoral study program. Specifically for this study program, the university has purchased equipment for monitoring, measuring and testing building structures. The exchange of research results is ensured in conference presentations.

2.3.3. The financial provision corresponds to the specifics and conditions of the study programme implementation, creates preconditions for achieving the study results and indicates the possibility to ensure a quality study process.
Minimum number of students to ensure profitability of the study programme:
On the basis of the 2015 Ministry of Education and Science "Study on updating of study costs coefficient in higher education and preparation of proposals for consolidating them", as well as empirical calculations of RTU and according to expert evaluations, in order to ensure profitability of the study programme, the RTU determines the minimum number of students in Doctoral studies – 8 students (Doctoral studies – due to the specific objective (primarily – scientific research) the minimum number of students is not strictly defined and is evaluated on a case-by-case basis).
Highly supported is teaching of doctoral students with scholarship or training from the resources of RTU organizational unit, if the doctoral student is also actively involved in the scientific and study work.

Conclusions on this set of criteria, by specifying strengths and weaknesses

Overall resources and provision of the study programme are compliant for the study programme.

Strengths:
1. The ORTUS platform has well-organized study materials, literature, curriculum and correspondence with lecturers and professors.
2. The technical provision of study materials, instruments, measuring equipment is sufficient and corresponds to the study plan and content.

Weaknesses:
1. The measuring instruments purchased by the university and used in the training process are not fully calibrated. Their readings are not completely verifiable. During the test procedure, some measuring equipment is not working or is not ready for operation.

Assessment of the requirement [6]

1 R6 - Compliance of the study provision, science provision (if applicable), informative provision (including library), material and technical provision and financial provision with the conditions for the implementation of the study programme and ensuring the achievement of learning outcomes

Assessment of compliance: Fully compliant

The study programme has all the necessary provisions for the implementation of the learning outcome

2.4. Teaching Staff

Analysis

2.4.1. For the doctoral study programme Civil Engineering (51582), comprehensive and detailed analysis of the presented facts and figures, (SAR, Doctoral study programme, code 51582), aim to assess the fulfilment of the criteria related to the number and CVs of teachers, as a base for high level of quality in study programme delivery, as well as the compliance with prescribed national legal act requirements and characteristics of the programme (Aims and learning outcomes).

The academic staff, who participates in the process of study programme delivering, consists of: 13 professors – Doctors of Science, (elected by the Professors' Council of Civil Engineering); 5 elected professors and Doctors of Science, (elected by the Professors' Council of Civil Engineering). In accordance with SAR, p.355, there are 11 engineering and technology experts of the Latvian Council of Science.

The ratio between elected and permanently employed teachers, and students, is approximately 1 to 2.
The involvement of academic staff in publishing of papers, (2015 – 2021), (279 articles in various research field – Engineering, 39,5%; Material Science, 28,5%; Physics and Astronomy,7,8%), in the journals indexed in SCOPUS, is presented on page 353. The mentioned articles have been cited 1230 times, (average 4, 4 citations per publication).This is presented on Figure, (SAR, and p.357). 16.8% publications belong to 10% of most cited publications globally, while 8.5% scientific articles were published in CiteScore top 10% journals. Furthermore, international cooperation in preparation of scientific articles should be emphasised. (p.357).

The above-mentioned quantitative indicators, as well as, other characteristics of the teachers' professional career, (presented for each professor separately – SAR), formed a good base for achievement of the aims, (". . . preparation of highly qualified specialists for research activities, preparation of academic staff for teaching at University level in the area of civil engineering and preparation of scientists for independent undertaking and supervision of research projects"), and intended learning outcomes. They are also in compliance with national legal act. (Chapter VI, Studies in a Higher Education Institution, Section 55, Study Programmes, Law on Higher Education Institutions, p.29), as well as, RTU Human Resources Development Plan. (". . . renewal of the academic staff, by promoting academic work of Doctoral students, improvement of the professional competence of the existing academic staff and attraction of foreign academic staff."(SAR, p.57)

2.4.2. There are several influence factors for changes to the composition of the teaching staff. It's about common reasons for changing (measures for overcoming are the same as those mentioned in analysis of other study programmes in Civil engineering), from which, retirement and employment in the construction industry, can be pointed out. Among other things, the discussions with the directors and teachers of the Study programme, (opinion delivered at separate meetings - 15th of February 2022), were focused on one, out of two main reasons why members of academic staff quit working at the study programme. It is, as stated, termination of employment due to commencement of work in the construction industry, which can offer a significantly higher salary. In terms of mentioned, the members of the expert group asked several questions: "How can the institution compete with the construction industry? Does the institution consider introducing more beneficial conditions to academic staff?"

In accordance with their opinion, the University gives significant support for teachers who are employed in the Institution. (Special section for research on RTU website, Research | Riga Technical University (rtu.lv), organising professional training, Fulbright award, doctoral and post-doc grants, participation in European projects). Moreover, directors of study programmes are constantly working on recruitment of new members of the academic and research staff, and involvement of foreign researchers (RTU Human Resources Development Plan).

2.4.3. In addition to the other indicators for the scientific research work of teachers, (presented in the previous chapter), part of the content of SAR relates to the list of 10 most significant papers, published by the teachers and doctoral students and indexed in SCOPUS and WoS (p.358). In addition, members of the academic staff who have the rights of an expert of the Latvian Council of Science are also presented (SAR, p.359).

2.4.4. There is a list of 15 most important international and Latvian scale scientific projects, (title of the project, reporting period, amount and source of funding, scientific supervisor), in which the members of the academic staff, involved in this study programme, together with doctoral students, take a part. (SAR, p.360).

2.4.5. The same mechanisms for cooperation of teachers in study programme delivery and in that way achievement of its aims, (already mentioned in other study programmes, such as student survey and alumni survey), are applied in the frame of this doctoral study programme. Additionally, there is an attestation meeting, (organised by the Scientific Committee of the Faculty of Civil Engineering, upon competition of every academic year), oriented towards testing of students' competencies in the frame of this programme, learning issues, progress in studies and similar discussions. (Actually, this is another form of feedback that can be used as a tool for improvement of studies).
Furthermore, the contents of study programmes are analysed, updated and optimised on the results of discussions in which all the teachers and associated industry professionals are involved (confirmed by the employers – meeting on Friday, 15th of February 2022). The mentioned cooperation is very useful for further promotion of the learning outcomes, development of the study courses and study programme as a whole.

Conclusions on this set of criteria, by indicating strengths and weaknesses

Quantitative and qualitative indicators regarding number of teachers involved in the process of delivering of this study programme, their qualifications (academic positions, results of scientific research work – number of papers published in the journals indexed in SCOPUS, number of citations, list of most significant international and Latvian scale scientific projects), represent a good base for high level of quality in the study courses delivering. Prescribed legal requirements are met (Law on Higher Education), organisation of study process regarding human resources is based on University "Human Resources Development Plan".
Changes to the composition of teaching staff is monitoring and targeted measures (support of the teachers' professional career, involvement the researchers from abroad, increasing the number of doctoral students, doctoral and post-doc grants) are put in place.
Various mechanisms towards high levels of cooperation between teachers in the processes of organisation of the studies, as well as connections between study courses/modules and study programme (results of regular surveys of stakeholders, first of all, students and teachers, meetings, seminars, participation in projects) are used. When it comes to doctoral studies, special attention is paid to so-called attestation meeting. It's about testing the students' competencies and, in that way, getting the feedback regarding students' evaluation of subjects and learning at the University.

Strengths:
1. High level of qualifications held by the teaching staff members.

Weaknesses:
1. There are no significant weaknesses for teaching staff in this study programme.

Assessment of the requirement [7]

1 R7 - Compliance of the qualification of the academic staff and visiting professors, visiting associate professors, visiting docents, visiting lecturers and visiting assistants with the conditions for the implementation of the study programme and the requirements set out in the respective regulatory enactments.

Assessment of compliance: Fully compliant

Law on Higher Education Institutions, Latvia, Section 55, Study Programmes.

2.5. Assessment of the Compliance

Requirements

1 1 - The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard

Assessment of compliance: Not relevant

2 2 - The study programme complies with a valid professional standard or the requirements for the professional qualification (if there is no professional standard required for the relevant occupation) provided if the completion of the study programme leads to a professional qualification (if applicable)

Assessment of compliance: Not relevant

3 3 - 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 561 , Paragraph two and Section 562 , Paragraph two of the Law on Higher Education Institutions.

Assessment of compliance: Partially compliant

Study course descriptions are well prepared and they contain all basic knowledge on the length, syllabus, learning outcomes, and evaluation methods in the study course. Nevertheless, compulsory literature should be revised and updated, because some of the literature is from 1970-2000s'. To create even better study course descriptions in the future RTU can consider adding a table which includes on what lecture, lesson what type of knowledge check will be held, and add more detailed descriptions on what will be learned in each lecture, lesson. Some descriptions contain the title of databases in Latvian See annex: RBDB0_EN.

4 4 - The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure according to which state recognised documents of higher education are issued.

Assessment of compliance: Fully compliant

Diploma issued complies with the state legislation. See annex of the study programme: Sample of the diploma.

5 5 - 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 Higher Education Institutions.

Assessment of compliance: Fully compliant

There are at least 5 PhD holders implemented in study programme. See annex: Apliecinājums - AL 55. pants par prof. skaitu akadēmiskās programmās (Confirmation - on compliance of the academic staff).

6 6 - 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 Higher Education Institutions.

Assessment of compliance: Fully compliant

For academic study programmes - Opinion of the Council of Higher Education in accordance with Section 55, Paragraph two of the Law on Higher Education Institutions. See annex: AIP Conclusion - Nr.84_RTU_Doc_Civil Engineering.

7 7 - 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 (if applicable).

Assessment of compliance: Fully compliant

Confirmation - on compliance of the academic staff of the doctoral study programmes.

8 8 - 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

Academic staff has sufficient latvian language knowledge for implementing study courses, see annex : Confirmation - knowledge of the state language.

9 9 - 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 (if applicable).

Assessment of compliance: Fully compliant

Academic staff have sufficient English language knowledge for implementing study courses. Confirmation available in annex: Confirmation - knowledge of the foreign language.

10 10 - The sample of the study agreement complies with the mandatory provisions to be included in the study agreement.

Assessment of compliance: Fully compliant

Study agreements include all necessary parts set in legislation. See the annex: Study agreement.

11 11 - The higher education institution / college has provided confirmation that students will be provided with opportunities to continue their education in another study programme or another higher education institution or college (agreement with another accredited higher education institution or college) if the implementation of the study programme is terminated.

Assessment of compliance: Fully compliant

The RTU has an agreement with LLU (Latvia University of Life Sciences and Technologies) that in case the study programme will be terminated students will be provided with option to continue studies in LLU. See file Agreement LLU and RTU. RTU in future should provide information about exactly which study programme students can continue their studies. This information also would be beneficial for the students.

12 12 - The higher education institution / college has provided confirmation that students are guaranteed compensation for losses if the study programme is not accredited or the study programme's license is revoked due to the actions (actions or omissions) of the higher education institution or college and the student does not wish to continue studies in another study programme.

Assessment of compliance: Fully compliant

RTU confirms that they will compensate losses for students in case of termination of study programme. See annex: Confirmation on compensation for losses.

13 13 - The joint study programmes comply with the requirements prescribed in Section 55.(1), Paragraphs one, two, and seven of the Law on Higher Education Institutions (if applicable)

Assessment of compliance: Not relevant

14 14 - Compliance with the requirements specified in other regulatory enactments that apply to the study programme being assessed (if applicable)

Assessment of compliance: Not relevant

Assessment of the requirement [8]

1 R8 - Compliance of the study programme with the requirements set forth in the Law on Higher Education Institutions and other regulatory enactments.

Assessment of compliance: Fully compliant

All regulatory requirements are met and fulfilled.

General conclusions about the study programme, indicating the most important strengths and weaknesses of the study programme

No significant deficiencies were found for this programme.
The aims are clearly structured, while the learning outcomes are in line with the strategic aims of the RTU. The duration of 4 years is found to be realistic and the number of Doctoral theses within the reporting period was sufficient.
The learning outcomes lack precision. This makes assessment of achieved learning outcomes difficult.
There is a strong market for the graduates, primarily due to impending retirements of highly qualified academics in Latvian universities but also in industry and state regulatory bodies.
The awarding of a degree is contingent on the researcher publishing at least one peer reviewed publication in a SCOPUS or Web of Science indexed journal, with Impact Factor.
The programme of study is implemented through a combination of lecture-based modules and independent research. A student-centred approach is reinforced by the involvement of Ph.D. students in the work of the Faculty of Civil Engineering Council.
Regarding promotion, the students work through a four-stage process to gain acceptance for preparation and defence of a thesis. Doctoral student research topics are relevant to the advance of knowledge in the study field and innovation in industry.
Changes to the composition of teaching staff is monitoring and targeted measures, (support of the

teachers' professional career, involvement the researchers from abroad, increasing the number of doctoral students, doctoral and post-doc grants), are put in place.
Various mechanisms towards high levels of cooperation between teachers in the processes of organisation of the studies,as well as connections between study courses/modules and study programme, (results of regular surveys of stakeholders, first of all, students and teachers,meetings, seminars, participation in projects), are used.

Evaluation of the study programme "Civil Engineering"

Evaluation of the study programme:

Good

2.6. Recommendations for the Study Programme "Civil Engineering"

Short-term recommendations

The number of students is dropping. The study programme in collaboration with the university management should explore methods and strategies through which this issue can be addressed.
Note on the availability of measuring instruments - the measuring instruments purchased by the university and used in the training process are not fully calibrated. Their readings are not completely verifiable. During the test procedure, some measuring equipment is not working or is not ready for operation. This needs to be identified and addressed.

Long-term recommendations

The phraseology of learning outcomes does not reflect the incremental higher order of challenge to the students as they progress up through the stages of the programme. This has to be addressed.
Compulsory literature needs to be reviewed and updated (especially for obsolete publications from 1970-2000). We recommend not to include obsolete literature sources (older than 20 years) in the subject descriptions. Valid but older literature sources could be included in the list of additional literature sources as needed.

II - "Heat, Gas and Water Techology" ASSESSMENT

II - "Heat, Gas and Water Techology" ASSESSMENT

2.1. Indicators Describing the Study Programme

Analysis

2.1.1. The study programme Heat, Gas and Water Techology (51582) is regulated and complies with the Law on Higher Education Institutions of the Republic of Latvia and the Classification of Education of the Republic of Latvia (see Annex 6 RBCSO).

2.1.2. The Doctoral study programme “Heat, Gas and Water Technology” (51582) is a full-time study programme with a total length of 4 years implemented in Latvian and English languages. The programme “Heat, Gas and Water Technology” fits in and complies with the study field Architecture and Construction, with an emphasis in engineering. The total number of CP in the study programme is 192 CP, which equals to 288 ECTS. The study programme complies with the State Standard for

Education. Admission requirements foresee a professional master's degree in construction of heat, gas and water engineering systems or professional master's degree in transport structures, or professional master's degree in construction, or equivalent education, for the studies in English, the level of knowledge of English at least B2 is required. The degree awarded is Doctor of Science (Ph.D.) in Civil engineering and Transport Engineering; or Doctor of Science (Ph.D.) in Environmental Engineering and Energy; or Doctor of Science (Ph.D.) in Environmental Biotechnology.

2.1.3. According to the SAR, the aim of the Doctoral study programme is to educate and train highly qualified and competitive professionals in the field of heat, gas and water technology with an in-depth body of knowledge, skills and competences, that are able to solve scientific tasks, work as lecturers, assistants, researchers in universities and research institutes. The quality of learning outcomes is provided by the system of cross compliance of the enrolment requirements with the study aims and tasks. During doctoral studies, students acquire competencies and research methods, scientific research on specific issues and make scientifically sound recommendations in various building construction sectors, heat, gas and water technology sub - sectors covered by both the opportunities offered by new technologies and the benefits of new construction materials. The aims, tasks and learning outcomes of the Doctoral study programme are interlinked. The University recognizes prior learning outcomes for PhD and master students rather than the bachelor programme. During the study visit, experts observed positive trends that several master and doctoral students had and their willingness to stay at the university as academic staff. PhD students receive support from the University in terms of participating in research projects, however during their studies students mentioned that the procedure to receive support is not clear.
Since the last accreditation, several improvements of the programme based on the previous period have been implemented. For instance, the recommendation “Laboratory equipment needs to be improved as a matter of urgency so that the latest technologies are available to students” was addressed. According to the SAR, in 2019, the process of reconstructing the building of the Faculty of Civil Engineering was launched. The implementation of the project was intended to significantly expand the area of the premises of scientific and study laboratories and to improve their equipment. In total, 4 large-use laboratory rooms with a total area of 280 square meters are provided for the Institute of Heat, Gas and Water Technology.

2.1.4. The number of students is found to be stable. As of April 2021, the total number of students at the PhD programme “Heat, Gas and Water Technology” is 27, which is 18 % lower compared to the students in 2017 (33 students). Students are mainly employed in private companies, municipal development departments and construction boards, design companies, public administrations and other sector-related organizations.

2.1.5 N/A

Conclusions on this set of criteria, by specifying strengths and weaknesses

The Doctoral study programme “Heat, Gas and Water Technology” (51582) is a full-time study programme with a total length of 4 years implemented in Latvian and English languages. The programme complies with the study field Architecture and Construction, where the total number of CP in the study programme is 192 CP, which equals to 288 ECTS. The number of students is found to be relatively stable.

Strengths:
1. PhD students are involved in research projects and can receive support through projects for their research activities.

2. English language competency of students was found to be at a high level.
3. A positive trend was observed where several master and doctoral students have willingness to stay at the university as academic staff.

Weaknesses:
1. Study programme learning outcomes should be revised at all levels.

2.2. The Content of Studies and Implementation Thereof

Analysis

2.2.1. The objective of the programme is to produce graduates at doctoral level to serve in academia or as highly trained specialists in municipal and private entities that provide engineering services to buildings and cities. The programme outcomes (SAR, p.507) are inappropriate for a doctoral programme, being identical to those of the masters programme (SAR, p.395). This is also reflected in the graduate attributes (SAR, p.515). Seven of the eight graduate attributes (SAR, p.515) are identical to seven of the eight graduate attributes of a masters degree graduate in the same specialisation (SAR, p.403-404). Further related to this, the programme aims are set out in phraseology that lacks the challenge expected for doctoral students. This point is developed in respect of module learning outcomes in the next paragraph.
The modules are aligned with the programme outcomes through a planning map (SAR, Annex 9). The learning outcomes for each module are set out in a comprehensive descriptor template (SAR, Annex 10). The descriptors are accessible to all relevant stakeholders through the ORTUS platform. The learning outcomes set out the knowledge, skills and competences to be achieved. The phraseology of the outcomes has been improved since the previous review but it has yet to fully capture the incremental challenge expected of students at different stages of study, not least at the doctoral level.
The Expert Group learned from meetings with staff that there is a strong market for the graduates of the programme as they may specialise and receive a Ph.D. degree classified as being in the field of ‘Civil Engineering and Transport’, ‘Environmental Engineering and Energy’; ‘Environmental Biotechnology’.

2.2.2. The awarding of a degree is contingent on the researcher publishing at least one peer reviewed publication in a SCOPUS or Web of Science indexed journal, with Impact Factor (SAR, p.518). the focus is on low energy buildings; building engineering systems; urban energy supply and urban water supply.

2.2.3. The programme of study is implemented with significant respect to a student-centred approach which encourages student autonomy in their studies. The internal quality assurance system operates effectively and includes student input.

2.2.4. Internship does not form a part of the programme.

2.2.5. The process of promotion operates through 19 Promotion Councils across the wider study field of engineering. The students work through a four-stage process to gain acceptance for preparing a thesis. Firstly, they must successfully complete prescribed modules. Secondly, they must prepare research goals and evidence of their research achievement towards these goals. Thirdly, they must present their research work to the Promotion Council and outline the thesis to be defended (p.527). Finally, the student defends the thesis.

2.2.6. The Expert Group reviewed ten topics at doctoral level in the reported period of this review.

All topics are relevant to the advance of knowledge in the study field and innovation in industry (SAR p.519). Research was conducted on topical issue such as erosion in river flood-lands; photovoltaic solar air conditioning; biological stability in drinking water networks; ferromagnetic sorbents for collection and utilisation of oil products; online monitoring of drinking water quality.

Conclusions on this set of criteria, by specifying strengths and weaknesses

The objective of the programme Heat, Gas and Water Techology (51582) is to produce graduates at doctoral level to serve in academia or as highly trained specialists in municipal and private entities that provide engineering services to buildings and cities. The programme outcomes are inappropriate for a doctoral programme, being identical to those of the masters programme. This is also reflected in the graduate attributes, where seven of the eight graduate attributes are identical to seven of the eight graduate attributes of a masters degree graduate in the same specialisation. Further related to this, the programme aims are set out in phraseology that lacks the challenge expected for doctoral students.

The learning outcomes set out the knowledge, skills and competences to be achieved. The phraseology of the outcomes has been improved since the previous review but it has yet to fully capture the incremental challenge expected of students at different stages of study, not least at the doctoral level.

There is a strong market for the graduates of the programme as they may specialise and receive a Ph.D. degree classified as being in the field of ‘Civil Engineering and Transport’, ‘Environmental Engineering and Energy’; ‘Environmental Biotechnology’.

The awarding of a degree is contingent on the researcher publishing at least one peer reviewed publication in a SCOPUS or Web of Science indexed journal, with Impact Factor.
The programme of study is implemented with significant respect to a student-centred approach which encourages student autonomy in their studies. The internal quality assurance system operates effectively and includes student input.

The four-stage process of promotion operates through 19 Promotion Councils across the wider study field of engineering. The topics of research contribute to the advance of knowledge in the study field and innovation.

Strengths:
No exceptional points to comment on.

Weaknesses:
1. The programme outcomes and graduate attributes are inappropriate for a doctoral programme, being identical to those of the professional master study programme in ‘Heat, Gas and Water Technology’.

Assessment of the requirement [5] (applicable only to master's or doctoral study programmes)

1 R5 - The study programme for obtaining a master's or doctoral degree is based on the achievements and findings of the respective field of science or field of artistic creation.

Assessment of compliance: Fully compliant

The awarding of a degree is contingent on the researcher publishing at least one peer reviewed

publication in a SCOPUS or Web of Science indexed journal, with Impact Factor. This peer-review process demonstrates that the study programme is based on the achievements and findings of the science field.

2.3. Resources and Provision of the Study Programme

Analysis

2.3.1. The study provision, both informative and material, technical, are compliant for the study programme Heat, Gas and Water Techology (51582). Informative resources are available from RTU Scientific Library, online databases, e-books, e-journals. (SAR p. 530-532). There is a procedure developed for convenient ordering of the resources from the library and a procedure for each student to request a limited amount of new materials of special interest (according to info from site visit meetings with academic staff and students). In addition RTU ORTUS e-platform is a significant tool for student and teaching staff communication. ORTUS provides access for each student to all the data of the courses taken during the studies, and gives understanding of the course structure. Both students and teaching staff highly evaluate ORTUS. There are extensive refurbishment works going on in the premises. Numerous new laboratories will be opened, which will promote development of the practical component of the study courses and introduction of technologies in the study process. Laboratory equipment is continuously updated with new additions. Also there are cooperation agreements with other research institutions about the use of research equipment (SAR p. 530 and info from site visit meetings with teaching staff).

2.3.2. There is active cooperation with the Latvia University of Life Sciences and Technologies, scientific conferences and workshops are being organised. The most significant foreign partners are universities from Lithuania and Estonia, Italy and Czech Republic. Scientific research, student and academic staff internship takes place (SAR p. 532 and info from site visit meetings with students and teaching staff).

2.3.3. The funding available to the study programme, funding sources and the use of funding ensures full implementation of the study process. The programme is funded both by state budget and from foreign tuition fees from physical entities. As the number of state budget funded seats at the PhD programme is regulated by the annual agreement between RTU and the Ministry of Education and Science, the funding does not show a clear tendency of rising or falling. The cost per student has been increasing in the period of the study year 2017/2018 to 2020/2021 (SAR p. 533). According to the annex to SAR Funding distribution between the cost items the major part (42%) is used for remuneration, leaving for example the position of business trip expenses with 0%. It leaves a question - is such distribution sustainable in the long term as such a great part is allocated for first necessities? The study programme has the minimum number of students to ensure the profitability of the study programme. The number of all PhD students in April 2021 was 27. According to the annex to SAR On minimal number of students in study programmes it is sufficient as this is a case of study programme that is strategically important for RTU and the state, thus RTU also ensures the implementation of study programmes with smaller number of students than in general in doctoral studies - at least 10 students for full-time and 8 students for part-time.

Conclusions on this set of criteria, by specifying strengths and weaknesses

Overall resources and provision of the study programme are compliant for the study programme. There is a decent provision of informative resources. Access to it is ensured convenient. Good material and technical provision, which will be significantly improved after ongoing extensive refurbishment works in the premises and opening of new laboratories. There is national and

international cooperation, joint activities, research, seminars and conferences present. At the same time, it is evident that the study programme would benefit from higher funding or distribution of funding providing a greater percentage for positions to provide more business trips and even more international cooperation.

Strengths:
1. Provision of informative materials, availability of library resources.
2. Well functioning RTU e-platform ORTUS.
3. Close cooperation with higher education institutions locally, from Baltic states and Europe.

Weaknesses:
1. The funding available to the study programme, the distribution of it.
2. Number of students does not reach the standard minimum.

Assessment of the requirement [6]

1 R6 - Compliance of the study provision, science provision (if applicable), informative provision (including library), material and technical provision and financial provision with the conditions for the implementation of the study programme and ensuring the achievement of learning outcomes

Assessment of compliance: Fully compliant

SAR p. 530-533. The study programme has all the necessary provisions for the implementation of the learning outcomes.

2.4. Teaching Staff

Analysis

2.4.1. Twelve teaching staff are associated with the programme Heat, Gas and Water Techology (51582) and all are highly qualified in the specialisation. Currently eight of these are members of the Latvian Council of Sciences. Several are also members of the Institute of Heat, Gas and Water Technology. (SAR, p.535-538).

2.4.2. The staff profile has been very stable in the reported period. Two departures have been counterbalanced by two additions, without any significant change to the average rank of the team (SAR, p.538). Overall any change is likely to be positive for the future of the programme, given the RTU commitment to support the international research profiles of new entrants

2.4.3. The staff are highly research active and the involvement of doctoral students in significant national and international projects is actively managed. The national and international research include Horizon 2020, InterReg IV, ERDF, and ERA-NET EU-LAC funded projects (SAR, p.543). These projects and the publications (see next paragraph) are highly relevant to the programme.

2.4.4. Collectively the staff have published several hundred papers with more than 200 in SCOPUS-indexed journals. A total of 137 articles have collectively been published in the period 2015-2021. Ten percent of the papers were published in CiteScore top 10% journals. Eight per cent of these publications are in the top 10% of the most cited publications globally. Citations per publication average 3.4 including 8 per 2016 publication to date (SAR, p.540).

2.4.5. The Expert Panel noted during meetings with staff that a collegiate approach is taken to the implementation of the programme. There is an annual meeting of staff and students at the time of

attestation of the doctoral students' competence. This provides a forum where staff and students share experience and exchange recent developments in the field. Feedback from doctoral students to the staff is also a part of the process allowing identification of thematic areas for improvement in the interconnection of the modules contributing to the programme (SAR, p.544).

Conclusions on this set of criteria, by indicating strengths and weaknesses

The teaching staff associated with the programme are highly qualified in the specialisation. Currently eight of these are members of the Latvian Academy of Sciences. Several are also members of the Institute of Heat, Gas and Water Technology.
The staff profile has been very stable in the reported period, with two departures being counterbalanced by two additions without any significant reduction in the average rank of the team.
The staff are highly research active in projects of significant impact to the study field. The involvement of doctoral students in national and international projects is actively managed.
Collectively the staff have published more than 200 in SCOPUS-indexed journals. A total of 137 articles have collectively been published in the period 2015-2021. Ten percent of the papers were published in CiteScore top 10% journals. Eight per cent of these publications are in the top 10% of the most cited publications globally. Citations per publication average 3.4 including 8 per 2016 publication to date.
A collegiate approach is taken to the implementation of the programme. An annual meeting of staff and students at the time of attestation of the doctoral students' competence provides a forum where staff and students share experience and exchange recent developments in the field.

Strengths:
1. The teaching staff associated with the programme are highly qualified in the specialisation and are highly research active in projects of significant impact to the study field.
2. The majority of staff are members of the Latvian Academy of Sciences, the Institute of Heat, Gas and Water Technology or both. There is an excellent collegiate atmosphere.

Weaknesses:
None noted

Assessment of the requirement [7]

1 R7 - Compliance of the qualification of the academic staff and visiting professors, visiting associate professors, visiting docents, visiting lecturers and visiting assistants with the conditions for the implementation of the study programme and the requirements set out in the respective regulatory enactments.

Assessment of compliance: Fully compliant

CV's of staff (SAR, p.535-538)

2.5. Assessment of the Compliance

Requirements

1 1 - The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard

Assessment of compliance: Not relevant

2 2 - The study programme complies with a valid professional standard or the requirements for the professional qualification (if there is no professional standard required for the relevant occupation) provided if the completion of the study programme leads to a professional qualification (if applicable)

Assessment of compliance: Not relevant

3 3 - 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 561 , Paragraph two and Section 562 , Paragraph two of the Law on Higher Education Institutions.

Assessment of compliance: Fully compliant

Study course descriptions are well prepared and they contain all basic knowledge on the length, syllabus, learning outcomes, and evaluation methods in the study course.

4 4 - The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure according to which state recognised documents of higher education are issued.

Assessment of compliance: Fully compliant

Diploma issued complies with the state legislation. See annex of the study programme: diploma paraugs

5 5 - 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 Higher Education Institutions.

Assessment of compliance: Fully compliant

There are at least 5 PhD holders implemented in study programme. See annexes: Confirmation - on compliance of the academic staff and Confirmation on compliance of the academic staff of the doctoral study programmes.zip.

6 6 - 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 Higher Education Institutions.

Assessment of compliance: Fully compliant

For academic study programmes - Opinion of the Council of Higher Education in accordance with Section 55, Paragraph two of the Law on Higher Education Institutions. See annex: AIP ENG

7 7 - 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 (if applicable).

Assessment of compliance: Partially compliant

Confirmation that the academic staff of the doctoral study programme includes not less than five doctors, there is no information how many experts are approved by the Latvian Council of Science in the branch or sub-branch of science in which the study programme intends to award a scientific degree. See annex: Confirmation - on compliance of the academic staff of the doctoral study programmes

8 8 - 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

Academic staff has sufficient latvian language knowledge for implementing study courses, see annex : Confirmation knowledge of the state language

9 9 - 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 (if applicable).

Assessment of compliance: Fully compliant

A statement of the higher education institution/ college on the respective foreign language skills of the teaching staff involved in the implementation of the study programme at least at B2 level according to the European Language Proficiency Assessment levels (level distribution is available on the website www.europass.lv, if the study programme or part thereof is implemented), see annex: Confirmation - knowledge of the foreign language

10 10 - The sample of the study agreement complies with the mandatory provisions to be included in the study agreement.

Assessment of compliance: Fully compliant

Study agreements include all necessary parts set in legislation. See the annex: Study_agreements.

11 11 - The higher education institution / college has provided confirmation that students will be provided with opportunities to continue their education in another study programme or another higher education institution or college (agreement with another accredited higher education institution or college) if the implementation of the study programme is terminated.

Assessment of compliance: Fully compliant

The RTU has an agreement with LLU (Latvia University of Life Sciences and Technologies) that in case the study programme will be terminated students will be provided with option to continue studies in LLU. See file Agreement LLU and RTU. RTU in future should provide information about exactly which study programme students can continue their studies. This information also would be beneficial for the students.

12 12 - The higher education institution / college has provided confirmation that students are guaranteed compensation for losses if the study programme is not accredited or the study programme’s license is revoked due to the actions (actions or omissions) of the higher education institution or college and the student does not wish to continue studies in another study programme.

Assessment of compliance: Fully compliant

RTU confirms that they will compensate losses for students in case of termination of study programme. See annex: Confirmation on compensation for losses

13 13 - The joint study programmes comply with the requirements prescribed in Section 55.(1), Paragraphs one, two, and seven of the Law on Higher Education Institutions (if applicable)

Assessment of compliance: Not relevant

14 14 - Compliance with the requirements specified in other regulatory enactments that apply to the study programme being assessed (if applicable)

Assessment of compliance: Not relevant

Assessment of the requirement [8]

1 R8 - Compliance of the study programme with the requirements set forth in the Law on Higher Education Institutions and other regulatory enactments.

Assessment of compliance: Fully compliant

All regulatory requirements are met and fulfilled.

General conclusions about the study programme, indicating the most important strengths and weaknesses of the study programme

It is concluded that the doctoral study programme “Heat, Gas and Water Technology” (51582) meets the requirements. No deficiencies were identified. Satisfactory action has been taken by RTU to address the single recommendation for the programme in the previous accreditation: laboratory equipment has been improved and the latest technologies are available to students. Furthermore, there are cooperation agreements with other research institutions about the use of research equipment.
The programme is implemented as a full-time study programme with a total length of four years. The awarded degree is Doctor of Science (Ph.D.) in Civil Engineering and Transport Engineering; or Doctor of Science (Ph.D.) in Environmental Engineering and Energy; or Doctor of Science (Ph.D.) in Environmental Biotechnology.
The programme aims are set out in phraseology that lacks the challenge expected for doctoral students. The programme outcomes are inappropriate for a doctoral programme, being identical to those of the masters programme. This is also reflected in the graduate attributes, where seven of the eight graduate attributes are identical to seven of the eight graduate attributes of a masters degree graduate in the same specialisation. Allied to this, the phraseology of module learning outcomes has been improved since the previous review but it has yet to fully capture the incremental challenge expected of students at different stages of study, not least at the doctoral level.
The programme is implemented in the Latvian and English languages. Admission to the studies in English demands the level of knowledge of English to be at least B2.
The funding available to the study programme, funding sources and the use of funding ensures full implementation of the study process. The programme is funded both by state budget and from foreign tuition fees. The number of state budget funded seats at the PhD programme is regulated by the annual agreement between RTU and the Ministry of Education and Science. The rate per student has been increased in the review period and the study programme has the minimum number of students required to ensure profitability. The number of all PhD students in April 2021 was 27. It may also be noted that the programme is strategically important for RTU and the state. Thus RTU ensures the implementation of doctoral programmes even if there were a smaller number of students - at least 10 students for full-time and 8 students for part-time.
Collectively the staff have published more than 200 papers in SCOPUS-indexed journals. In the period 2015-2021 10% of the papers were published in CiteScore top 10% journals and 8% of the publications are in the top 10% of the most cited publications globally.
A collegiate approach is taken to the implementation of the programme.

Strengths:
1. The teaching staff associated with the programme are highly qualified in the specialisation and are highly research active in projects of significant impact to the study field. There is an excellent collegiate atmosphere.
2. Close cooperation with higher education institutions locally, from Baltic states and Europe.
3. PhD students are involved in funded research projects and can receive support through these projects for their research activities.

4. The English language competency of students is at a high level.
5. A positive trend was observed regarding building research capacity at RTU whereby graduates have a strong interest in staying at the university as academic staff.
Weaknesses:
1. The programme outcomes and graduate attributes are inappropriate for a doctoral programme, being identical to those of the professional master study programme in ‘Heat, Gas and Water Technology’.

Evaluation of the study programme "Heat, Gas and Water Techology"

Evaluation of the study programme:

Good

2.6. Recommendations for the Study Programme "Heat, Gas and Water Techology"

Short-term recommendations

The programme aims need to be revised to better reflect the higher order of learning expected of doctoral students compared to masters degree students.

Long-term recommendations

Following revision of the programme aims, the learning outcomes of modules should be refined with phraseology that better reflects the higher order of learning expected of doctoral students.

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 2.1 of the Law on Higher Education Institutions, the higher education institution/ college shall ensure continuous improvement, development, and efficient performance of the study field whilst implementing its internal quality assurance system:	Fully compliant			The University implements its QA standards to monitor and develop its programmes and their efficient performance.

Requirements	Requirement Evaluation			Comment
R2 - Compliance of scientific research and artistic creation with the level of development of scientific research and artistic creation (if applicable)	Fully compliant			The research themes are strategically resourced to align with national research policy and priorities. The relevance and impact of research is maintained at a high level through close collaboration with the industry. There is a strong innovation culture in the teaching and research environment.
R3 - The cooperation implemented within the study field with various Latvian and foreign organizations ensures the achievement of the aims of the study field.	Fully compliant			The higher education institution cooperates with various Latvian and foreign organizations not only in educational institutions. The cooperation involves various actors like professional associations, employers, NGOs. etc. The cooperation has strong roots, the main activities are students internships, research activities etc. Coorperation_agreements.pdf Foreign students_academic staff.pdf Mobility by programmes_EN.zip Incoming_outgoing mobility accademic staff.pdf
R4 - Elimination of deficiencies and shortcomings identified in the previous assessment of the study field, if any, or implementation of the recommendations provided.	Fully compliant			Previous recommendations mostly have been taken into account, those suggestions that are not fully fulfilled are acknowledged and RTU is still improving them and they can be viewed as challenges for the university not weaknesses.

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)
1	Civil Engineering (41582)	Not relevant	Fully compliant	Fully compliant	Fully compliant	Good

No.	Study programme	R5	R6	R7	R8	Evaluation of the study programme (excellent, good, average, poor)
2	Engineering of Regional Development and Urban Economics (42581)	Not relevant	Fully compliant	Fully compliant	Fully compliant	Good
3	Geomatics (42581)	Not relevant	Fully compliant	Fully compliant	Fully compliant	Good
4	Civil Engineering (42582)	Not relevant	Fully compliant	Fully compliant	Fully compliant	Good
5	Heat, Gas and Water Techology (42582)	Not relevant	Fully compliant	Fully compliant	Fully compliant	Good
6	Transportation Engineering (42582)	Not relevant	Fully compliant	Fully compliant	Fully compliant	Good
7	Architecture (43581)	Not relevant	Fully compliant	Fully compliant	Fully compliant	Good
8	Civil Engineering (43582)	Not relevant	Fully compliant	Fully compliant	Fully compliant	Good
9	Innovative Solution in Geomatics (45581)	Fully compliant	Fully compliant	Fully compliant	Partially compliant	Good
10	Innovative road and bridge engineering (45582)	Fully compliant	Fully compliant	Fully compliant	Partially compliant	Good
11	Architecture (47581)	Fully compliant	Fully compliant	Fully compliant	Fully compliant	Good
12	Geomatics (47581)	Fully compliant	Fully compliant	Fully compliant	Fully compliant	Good

No.	Study programme	R5	R6	R7	R8	Evaluation of the study programme (excellent, good, average, poor)
13	Civil Engineering (47582)	Fully compliant	Fully compliant	Fully compliant	Fully compliant	Good
14	Heat, Gas and Water Techology (47582)	Fully compliant	Partially compliant	Fully compliant	Fully compliant	Good
15	Transportation Engineering (47582)	Fully compliant	Fully compliant	Fully compliant	Fully compliant	Good
16	Architecture (51581)	Fully compliant	Fully compliant	Fully compliant	Fully compliant	Good
17	Civil Engineering (51582)	Fully compliant	Fully compliant	Fully compliant	Fully compliant	Good
18	Heat, Gas and Water Techology (51582)	Fully compliant	Fully compliant	Fully compliant	Fully compliant	Good

The Dissenting Opinions of the Experts

There are no dissenting opinions of the experts.