

# Expert group joint opinion

Evaluation Procedure: Assessment of Study Field

Higher Education Institution: Rēzekne Academy of Technologies

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

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

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The expert team finds the assessed study field “Mechanics and Metal Processing, Heat Power Engineering, Heat Technology, and Mechanical Engineering” (hereafter referred to as: Study Field) matching both the Rēzekne Academy of Technologies (RAT) mission as well as needs of the local economy, society and education, hence it recommends it to be accredited. At the same time, experts have noted certain shortcomings addressed to university management and program directors.

RAT has developed a system to determine the financial resources required for the implementation of the study field and its four study programs, and these resources are available. Management, study program directors and employees and generally satisfied with the financial and other resources at the study field. There is a huge potential with new equipment to increase the cooperation with industry of terms of projects and generating more income. RAT has ensured good infrastructure and necessary resources, material and technical provision required for the implementation of the study field and its four study programs. The students and the teaching staff have access to the necessary resources. There is a common system and procedures for the improvement and purchase of the material, technical, methodological, and informative provision. The equipment in laboratories is suitable for research work and for educational purposes. IT infrastructure is also very good, there are computers available on campus. Library has been praised by all stakeholders with the provision of literature, IT resources and services. RAT has developed clear procedure how to attract highly skilled teaching staff and motivate for further development in the study field and its four study programs. The academic and research workload of the teaching staff is pretty high, but no complaints were given. In general students are satisfied with different support systems in place, they are missing more interface with companies.

Experts highly appreciate the contribution of RAT staff to the development of the scientific sector, as well as to the promotion of cooperation with foreign partners. The modern equipment and the enthusiasm of the staff allow to carry out both the teaching and the scientific process efficiently. Nevertheless, it is necessary to continue to work more actively in the preparation of scientific projects and publications in high-impact journals, which would thus promote international recognition and increase of doctoral students in the newly established study program Laser Technologies. Despite significant measures to improve the study process, the number of graduates compared to the number of first-year students is still relevant. Therefore, the improvement of the study process, study materials, teaching methods and bibliography must be perceived as a challenging element in the development of RAT study programs.

The Quality policy in RAT is in good order; all of the study programmes are updated according to the professional standard and the needs of the industry. Changes in the study programmes are introduced every year to meet the needs of the rapidly changing industry, as well as students' knowledge. RAT gathers a vast amount of data about the study programmes by surveying the students, graduates and employers, but the response rate of the surveys by graduates and employers is rather low. The surveys gather feedback on how study programmes should be improved, but there is a lack of proof regarding it from the side of students. According to the self-assessment, students have a chance to submit complaints and proposals in the internal regulatory enactments of RAT, but the students lack information about how to submit their complaints outside of annual surveys. The students and employers rarely receive feedback on how their recommendations or complaints are handled, so RAT should seek more ways to provide feedback

regarding the changes in the study programmes implemented upon the feedback from surveys, as well as new ways to gather and discuss potential and needed changes. In a general view the quality policy of RAT is well organised and working, but improvements should be made regarding informing the stakeholders about changes.

RAT has established a very open and mutually beneficial tripartite cooperation between teachers, students and industrial companies. This undoubtedly creates great conditions for collaboration and motivates all involved parties to work well together and to desire to make improvements. The study and practical work times are flexibly adapted to the needs of different level students, which at times creates confusion for the students just beginning the program. It may be necessary to survey students and make appropriate changes based on the survey results. The overall technical equipment is at a high level, some equipment is equipped with modern or even the latest technologies in the region. Students have ample opportunities to learn about this equipment and, in some laboratories, even to experiment and conduct creative research as much as possible. Curricula are constantly adapted to the latest industry trends in cooperation with partners both at the university level as well as following the recommendations of leading manufacturing companies. Consequently, in some fields of study, discrepancies arise between the technical capabilities of equipment and the theory taught.

## **I - Assessment of the Study Field**

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#### **1.1 Management of the Study Field**

##### **Analysis**

1.1.1. The aims of the study field are clearly defined and already proven to have been attainable by many concrete realizations in practice. It is beyond any doubt that the study field serves as a critical element of the local development undertakings which generates important effects like the strong international cooperation with renowned, globally relevant international partners such as ZVK GmbH Germany and others. This is to be complimented even more if the fact the the Latgale region happens to be among the poorest areas in Latvia is taken into account.

Even though the expert team could not analyse the Latgale region development strategy in more detail due to the language barrier, the study field and the relevant study programmes could be seen as aligned with the main directions of the regional strategic development. The interviewed representatives from the local government were providing straightforward feedback and substantiated reasoning proving the RAT has been playing an important role in securing the key regional strategic development objectives are met. Moreover, the study field and the study programs taught generate a number of positive spin-off effects. As suggested earlier, according to the interviewed academics, graduates and representatives of the local employers the very fact that high-quality professionals are educated at the RAT makes both Rezekne and Livani municipalities more livable and hence attractive to individuals throughout Latvia and even beyond.

1.1.2. From the feedback collected and documents consulted, it may be deemed that the RAT had undertaken adequate SWOT analysis prior to formalizing its key strategic development documents such as, for instance, the "OPERATION AND DEVELOPMENT STRATEGY of Rezekne Academy of Technologies 2016-2023". The soundness of such an operating practice is clearly visible in the outputs of the SWOT-driven undertaking. Thus, for instance, it is clear that the RAT has managed to realize objectives such as "To become the leading center for engineering, technologies, research and innovations in Eastern Latvia" (Objective C1.1) or "To promote the international recognition of

the study program and sustainable cooperation, providing attraction of foreign students and academic staff" (Objective C2.3) set forth by the actual strategy document, but equally so has recognized which of the objectives that had been set are yet to be reached in the forthcoming planning period from 2023 onwards. Nevertheless, the expert team feels more refined analyses should have been undertaken to complement the current practice and provide detailed feedback on the current market trends and revenue/student enrollment potential.

Moreover, in the self-evaluation report (p106) it has been clearly pointed out that metal working industry contributes greatly to Latvian GDP and that in 2020 only, it sought 1.000 engineers. At the same time the RAT has failed to comment and analyse the declining number of students and revenue which contradicts the given immense need for qualified engineering personnel. In this regard the expert team recommend more effort is invested in analyzing potential remedies to the situation which have more to do with internal organisation and study content provision, rather than with external causes such as negative demographic trends and similar.

Finally, the RAT should pay extra care its operational practice follows a certain business logic in addition to research interest. Thus, for instance, in the self-evaluation report (p15) a weakness has been identified suggesting "...insufficient external funding for the purchase and maintenance of laboratory equipment..." hinders RAT's progress. At the same time under strengths it has been suggested that laboratory and workshop equipment should allow diploma theses to be completed by prototyping new products in technical readiness levels as high as TRL6 and beyond. As all these levels correspond more to commercialization than to research-driven undertaking, it remains unclear what would be a business logic behind RAT's investments in rather expensive commercialization-focused equipment.

1.1.3. The management structure of the RAT follows a typical organisational pattern in use in the Latvian higher education system. As such, it features a number of organisational bodies with rather inflexible size and operating practice. This inflexibility has clearly been recognized by the Latvian Government in addition to the RAT's themselves and as such new management bodies such as a council focusing on research issues are soon to be added to the organisation. Nevertheless, there are still a lot of unknowns to be sorted out and the proposed system has already failed to be fruitful in its initial attempts to appoint representatives from the industry. In addition, the feedback from the interviewed academics has demonstrated almost unanimous skepticism as to the expected effects of the proposed. As such, it remains to be seen whether the target organisational changes would lead to a more agile decision making process or not. It needs to be said however that even though the expert team fully appreciates that the proposed new organisation has been mandated by the Latvian government and as such is hard to be influenced by individual HEIs, the expert team still maintains that more efforts should be taken to try steering the government intentions such that an organisational structure which would enjoy full support of the academics is reached and would be more likely to match challenges of the 21st century decision making.

The decision making processes very much depend on the organisational level they apply to. According to the feedback received from the interviewed academics, present decision making may only be seen matching the agility of the 21st century industry processes at departmental levels and pertaining to moderate liabilities. All other cross-departmental and/or financially hefty decision making has been rather slow and possibly overadministered.

In addition to contemplating different organisational changes and decision-making changes in order to secure agile 21st century-profiled operation, the RAT should also consider revising the KPIs its operations are evaluated against. Thus, for instance, the RAT uses the number of companies

founded by the graduates as an important KPI. The expert team does indeed compliment the RAT intention to stimulate pioneering attitude among students and staff, however, it is not entirely clear in what way it is critical to value the quality of the RAT by the entrepreneurial potential of a graduate, especially given that a firm may be founded and turn out to be unsuccessful.

1.1.4. It may be said that the RAT has established an effective system of procedures for student admission recognizing relevant achievements of a prospective student and making critical admission information available on the website. Nevertheless, as a STEM-oriented institution, it would be somewhat expected that more focus is given to assessing student's competences in engineering-related disciplines in addition to results from national matriculation exams. Such an approach is likely to benefit both the RAT as well as the prospective students as it would manage their expectations with respect to the studying outcomes better. Better expectation management is also likely to influence positively the interest among prospective students and hence tackle the problem of declining number of students.

The expert team fully appreciates the RAT has been considering this issue to be addressed and, according to the feedback collected, proposals were already made to include Physics assessment as a mandatory pre-entry procedure. However, the feedback collected also suggested students tend to have difficulties in passing the matriculation exam in Physics and as such, the proposals on the admission criteria upgrade had to be downsized. Such an operating practice the expert team finds appropriate and a good example of sound, evidence-based decision making.

Despite the obvious effectiveness of the admission procedure, there are certain discrepancies to be addressed. Thus, for instance, in the self-evaluation report (p51) it is said that, to be admitted to the doctoral study programme, if the applicant has got a master degree from a non-engineering or a corresponding field of professional activity, he/she needs to prove his/her work experience or non-formal education that corresponds to the knowledge, skills and competences in mechanical engineering and mechanics. However, it remains unclear in what way or to what extent this has been done in practice. Given the moderate interest for the given doctoral study, concerns may be raised as to RAT's potential temptation to ease up the admission criteria for applicants with previous research interests in fields other than engineering and technology.

1.1.5. Methods and procedures for assessing student achievements have been set and have proven to be effective. The evaluation procedures are given and formalized in the corresponding regulation documents which are publicly available at [https://2021.rta.lv/study\\_quality\\_management\\_system](https://2021.rta.lv/study_quality_management_system) or have been a part of various other publications targeting HEIs current and prospective students. Unfortunately, some of these are only available in Latvian. The introduced procedures and the pertaining regulation documents may be deemed straightforward and reflecting good academic practices in assessing student work.

However, from the feedback collected, it may be concluded that various socially-related issues having to do with the local area were an important factor driving the setting up of the study programs. At the same time, the expected learning outcomes that have been set are mostly either engineering or science/research related. Given the importance of the study field and the corresponding study programs for the local region, the expert team feels the learning outcomes should also reflect some of their potential direct or indirect contributions the local region.

1.1.6. It may be deemed that the RAT has set up effective mechanisms for safeguarding academic integrity and preventing various forms of ethical misconduct. In addition to typical software solutions for tackling anti-plagiarism such as the introduced PlagScan software, the RAT has also introduced

the corresponding formalized regulations aimed at measuring, controlling and preventing unethical behavior. A key regulation setting up basic principles of academic working and doing is the Code of Ethics document which stipulates fairness, professionalism and conscience to be the pillars of ethical conduct at the RAT. Given the nature of these pillars, promoting them has also been a part of RAT endeavor to introduce high standards of ethical behavior. The RAT has thus been organizing various thematic events and personal development trainings such as lectures on intellectual property rights safeguarding and similar.

Despite the obvious high awareness on academic ethics, the feedback collected undoubtedly shows the RAT has been heavily involved in all kinds of innovation work. This raises questions on intellectual property rights (IPR) and concerns on the adequacy of the practices applied by the RAT in making sure the student work/work of an academic which may be qualified as an innovation would not be taken advantage of. The RAT has introduced practice in which the student innovative work is first checked for its commercialization/patenting potential by the Dean, which is then followed by an assessment done by a commission jointly membered by academics and a student. As such, it may be deemed the RAT has established effective practices of safeguarding IPR. Moreover, the same processes have proven to be effective in protecting integrity of typical academic processes such as tackling plagiarism in academic writing and similar. However, more work needs to be done to prevent and/or regulate potential conflict of interest in circumstances where lecturers run their own businesses in parallel with pursuing their academic careers at the RAT.

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

Conclusions:

Even though it is clear the RAT exercises a SWOT-driven operating practice, this should be complemented by more refined analysis of the target market, economy or revenue potential of a given undertaking. The management structure features a number of organisational bodies with rather inflexible size and operating practice. As such, efforts should be taken to try steering the government intentions to introduce organisational changes such that an organisational structure which would enjoy full support of the academics is reached and would be more likely to match challenges of the 21st century decision making. The decision making processes must be made more agile and matching the decision making in the industry/economic sector the RAT targets for partnering. Certain KPIs the RAT utilizes to assess its operation against are rather questionable for their reach and meaningfulness. One such KPI is the number of companies founded by the graduates. Although it is beyond any doubt that the RAT pays special attention to promoting and exercising high standards of ethical behavior, there is considerable room for improvements in areas having to do with intellectual property right preservation and deterring conflict of interest in circumstances where lecturers run their own businesses in parallel with pursuing their academic careers at the RAT.

Strengths:

1. The RAT is clearly run and operated by highly motivated people. Such a motivation implies staff complacency with both the academic/research orientation of the HEI as well as with the subjects taught.
2. The focus on state-of-the-art technologies and practices such as laser technologies, electromobility and similar is proven to generate significant positive effects to both the RAT and its gravitational area.
3. High employability of the graduated students clearly implies a good quality "end-product". Graduated students prove to be highly employable both in Latvia and abroad primarily as a result of

the quality knowledge and practical experience gained during their study.

4. In addition to its academic work, the RAT has also been recognized for its engineering excellence way beyond Latvian borders by renowned industry partners.

Weaknesses:

1. Lack of argumentation to certain strategic undertaking provided by refined target analysis of a given market, industry sector or territory.
2. Tendency to take things as they are and unwillingness to exercise "out-of-the-box" thinking. Examples of such an attitude include the complacency with the organisational changes introduced by the Latvian Government despite the omnipresent skepticism on their purposefulness among the academics.
3. Cumbersome organisational structure and rigid decision making processes.

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

### **Analysis**

#### 1.2.1.

According to the self-assessment of RAT, a study quality management system (QMS) was implemented in 2005, and it has been running up until this day; this system goes hand in hand with the development strategy of RAT. QMS evaluates RAT's work in terms of its development strategy and evaluates the study programs, study process, equipment, infrastructure, etc. QMS has been developed considering the excellence model of the European Foundation for Quality Management (EFQM) and ISO9000 standard recommendations.

The quality system ensures continuous improvement and development in various ways, one of them being annual student surveys. According to the interviews with the students, in these surveys, students need to evaluate each study course from 1-to 10 and leave several comments about how well the course was delivered, what they like/dislike, what they lack, etc. There are annual graduate and employer surveys as well to help raise the quality of the studies. The study field council reviews all of the reviews and comments from the surveys. According to the interviews with students and academic staff, if a problem occurs during the semester regarding the quality of the course, the person responsible for the course discusses changes with both the students and the study program director. In most cases, changes are implemented after a few weeks.

Additionally to QMS, RAT has developed a Quality management handbook available online. In conclusion, the Quality policy in RAT is in good order; all of the study programs are updated according to the professional standard. Changes in the study programs are introduced every year to meet the needs of the rapidly changing industry, as well as students' knowledge.

#### 1.2.2.

According to the self-assessment, the program development is closely connected with the development strategy of RAT. To ensure continuous development of study programs, RAT ensures a continuous collaboration between students, academic staff and administrative staff. The process of development and improvement of the study programs involves forming a working group, which includes the teaching staff, general staff and students.

Although in the self-assessment report, the quality assurance system seems very good, in the interviews, both students and the academic staff could not provide examples of what changes have been implemented in the study programs after recommendations from the students. The only examples provided by the academic staff were the changes of the study program so it would suit the new standard of the profession. Resulting from this, RAT should examine how the academy collects

actionable information from the students and review its application of student-centred learning concepts.

According to the interviews with the academic staff, some staff members collect individual feedback about their subjects; primarily, this exchange of feedback is done verbally after the lessons. Such action is applaudable from the academic staff but does not provide any actual data about how study programs are tailored throughout the years.

One of the potential solutions could be mid-semester surveying since currently surveying is done only after the semester ends. In this way, the academy could get valuable data on how students evaluated the subject at the beginning and end of the semester. Mid-semester surveys could also give a chance to implement the recommendations of students while they are already studying so that they would see changes.

In conclusion, RAT not only surveys students but graduates and employers as well and collects all of the necessary feedback to base improvement of the study programs on. However, in some cases, there is a lack of proof that the changes were implemented, which could be solved by a follow-up meeting.

### 1.2.3.

The information and all documents regarding the quality policy are available online for students to view. According to the self-assessment, students have a chance to submit complaints and proposals in the internal regulatory enactments of RAT.

According to the student interviews, all academic staff is always open to new ideas from the student side. However, aside from talking to the academic staff and providing their opinion in the surveys, they did not know how they could submit any complaints about the study program or a particular course.

The student council of RAT also helps in quality assurance by creating a “trust inbox” where students can leave their complaints, as well as collecting them in other ways and involving in the problem-solving process.

In conclusion, students should be educated more about how they can submit recommendations and complaints outside of the annual surveying, but the quality assurance system works as it is supposed to.

### 1.2.4.

According to the self-assessment report and interviews with the students, graduates and employers, RAT collects various kinds of information from them, starting with lecture attendance and employment, ending with further qualification and other data. All of this data is analysed by RAT. However, unfortunately in the interviews, students, graduates and employers were not able to provide sufficient proof about how their recommendations are taken into account. A great part of the employers were not informed about official surveys.

In conclusion, RAT should seek more ways to provide feedback regarding the changes in the study programmes implemented upon the feedback from surveys, as well as new ways to gather and discuss potential and needed changes.

### 1.2.5.

The information on official registers mentioned above corresponds with the information provided online by RAT. Information about the study program “Mechatronics” is available in Latvian, but for the masters and doctoral program “Laser technologies”, the descriptions are provided in English. In the documents provided to the expert group, the admission criteria and other information were in much more detail than can be seen on the website of RAT. Even though the study program content

is provided, the webpage RAT lacks descriptions of each separate study course as well as general description of the study program. The availability of such information is essential, because the content of the study courses is one of the main things that could attract more students to the academy and study programs.

In conclusion, the information in official registers corresponds with information on RAT's website, but RAT could improve it.

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

As mentioned before, 17 years ago RAT had developed a quality management system (QMS) and throughout the years the system has been developed so it would contribute to the improvement of the study programs and their content. In the self assessment report QMS looked very good, but in the interviews there was lack of proof regarding implementation of recommendations, therefore the improvements relying upon students feedback could be improved. Students were not well enough educated about the system on how they can submit complaints, but on the other hand, they had no complaints about their study programs, therefore a conclusion can be made that they never needed to use this system. Information about this possibility is available online, so they have the chance to look it up if it is needed. RAT collects a good amount of information from the stakeholders, but lacks follow-up meetings so that the stakeholders would have the knowledge about the implementation process of their recommendations.

#### **STRENGTHS**

1. Well establishes and developed Quality management system
2. Various data collected from employers, graduates, students

#### **WEAKNESSES**

1. Lack of proof that student feedback is taken into account.
2. Limited information available on RAT webpage both in English and Latvian
3. Students, graduates, employers not informed about implementation of their recommendations

### **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:** Partially compliant

RAT has established a quality management system and quality policy, therefore providing continuous development and improvements in the study field. RAT has a clearly defined system to gather complaints and recommendations regarding the study field, but unfortunately there is lack of proof regarding how recommendations and complaints of students are implemented in the study process.

- 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

RAT has established a quality management system and quality policy, therefore providing continuous development and improvements in the study field.

- 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

RAT has a clear mechanism on how study programs are developed and approved. Each study program undergoes evaluation every year.

- 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 criteria, conditions and procedures for evaluating the outcome of students work is clear and ensures achievement of learning outcomes.

- 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

RAT offers its academic staff many possibilities in the life learning centre to raise their work quality, as well as mobilities, other learning opportunities, courses payed by the academy, etc. RAT continuously informs its academic staff about these opportunities.

- 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:** Partially compliant

RAT collects information from both graduates and employers regarding the employment status, knowledge, etc of their students. Information is collected about satisfaction of the study program as well. RAT has defined their KPI's where one of the points is employment of graduates. The response rate of surveys is rather low and a great part of employers were not informed about official surveys.

- 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

In the self assessment report this system is described as well working, but from the interviews with students, there is a lack of proof regarding how changes are implemented in the study process and whether they are taken into account. Overall the study programmes are updated every year to suit the needs of the industry, as well as to teach the newest methods used in research and industry. There are annual evaluations of the study programme from the study branch council to ensure the best quality for the study programmes.

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

#### **Analysis**

1.3. 1. RAT has total common financial budget for the whole Academy, and has developed funding system for the implementation of the study field and its four study programs. They receive funding from state and project funding (around 80 % of total budget). Other incomes are mostly from student tuition fees and contractual work. RAT has a system of distribution of financial resources on the level of study field and study program. The main criteria is number of students. For new study programs, such as doctoral study program Laser technologies, they use reserves from institution

revenues. In general RAT management and study program directors are satisfied with funding for the implementation of study programs. Scientific research funding is not divided by study fields, but allocated for the whole RAT. The amount of financial resources from industry is rather low (less than 20.000 EUR in 2021). The industry seems to be more interested in obtaining students/graduates than joint professional and research work with the institution.

1.3.2. and 1.3.3. The infrastructure at RAT in terms of buildings, classrooms, rooms for teachers, offices, computer rooms and laboratories is at a very high level. RAT has its campus with several existing buildings and additional buildings that are still in progress in the total size of 4,2 hectares, divided into 4 study blocks. Several parts of this infrastructure are shared among faculties, such as Library. During the on-site visit we had an opportunity to see different laboratories and equipment that is used for educational and research purposes. We were able to see Physics laboratory, Mechatronics laboratory, Laboratory of electrical engineering, electronics and electric actuators, Laboratory of fluid mechanics and hydraulics, Laboratory for research of mechanical properties of materials, Mechanical workshop, CAD/ CAE/ CAM laboratory - all these laboratories are extremely well equipped, providing students and researchers a great opportunity to develop their competences. One of the newest acquisitions is laser center with 15 different high-tech lasers. Library has several parts, such as reading room, a collection and cataloguing sector, a bibliography and information sector, all together almost 500 m<sup>2</sup>. It provides students and academic staff with the opportunity to use computers and access different databases like LAIS, scientific journal and article collections EBSCO, ScienceDirect, Scopus, Web of Science and other. The literature provision rules describe a process for obtaining new literature for academic staff and students. The library has a vast number of titles for all evaluated study programs both in Latvian and English language. The library is open on business days from 9:00 until 17:00/18:00 and according to demand sometimes on Saturday. Students had no complaints about opening hours and library flexibility.

1.3.4. RAT provides students with necessary software in the field of study programs, such as Solidworks, MasterCam, Siemens solutions, MatLab etc. Students have access to software on their computers. In general RAT uses Moodle for the study process, but during the Covid-19 period they are using MS Teams. Teachers upload necessary resources on Moodle and at the moment more frequently on MS Teams. MS Teams and Youtube are also used for teachers to upload their recorded lectures. Students have also access to Cloud solutions. Students are satisfied with online study, practical work was done at RAT in laboratories.

1.3.5. RAT academic staff is regulated via several internal guidelines, plans, procedures as described in SER, page 42, and state laws. The most important criteria for the selection of the academic staff are scientific and professional competence. Open calls are in place for new jobs, published in different media, where domestic and foreign experts can apply. RAT tries to attract their own excellent (doctoral) students to continue their work as researchers or assistants at RAT, and this way develop future employees during their study years.

1.3.6. Employees at RAT have many different opportunities for didactic development and other aspects of professional development in general. They are offered trainings in English language. Once in the election period academic staff has to attend development program University Didactics or Innovations in Higher Education. In the last two years they had intensive trainings in online teaching methods and use of ICT support. Academic staff has also the opportunity to make an internship in companies which are close to their study courses. They also participate in Erasmus+ and other projects mobility, but at the moment incoming and outgoing numbers are rather low. RAT has also Life Learning Centre that provides different kinds of programs, e.g. improving skills and knowledge in innovation, methodology etc. There is also a voluntary opportunity for academic staff to apply for

an evaluation of the quality of work, which provides for the determination of the quality coefficient, which is applied to the next year's salary.

1.3.7. The workload of academic staff consists of lecturing, research work, administrative work and working on different projects. Therefore, workload for academic staff is quite big, but there were no complaints from staff. Study directors and human resources department coordinates their work flow and regulates so that everything is according to the regulations. Currently there are no complaints from the staff, if its too much for them, they can refuse certain tasks.

1.3.8. As it is already pointed out above, students have good study conditions in terms of infrastructure: buildings, lecture rooms, computer rooms, library, access to scientific data bases, also in remote studies. They have access to different software, they can access RAT premises for practical work. RTA offers also sports infrastructure, among other options they have contract with national Olympic center, where students can play volleyball and use the gym for free. Besides that RAT offers career development support in terms of consultations and RAT Career portal, but students are not that familiar with these options. Students are very satisfied also with direct support from academic staff. What is missing is a more formal tutorship system, which is present mostly in graduate study programs. Students are satisfied with the amount of practical work in laboratories, but would like to participate on more challenges / project directly from local companies.

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

Conclusions:

RAT has developed a system to determine the financial resources required for the implementation of the study field and its four study programs, and these resources are available. There is a system for financing the scientific research activities in place, but on the level of the whole institution. Management, study program directors and employees and generally satisfied with the financial and other resources at the study direction. There is a huge potential with new equipment to increase the cooperation with industry of terms of projects and generating more income.

RAT has ensured good infrastructure and necessary resources, material and technical provision required for the implementation of the study field and its four study programs. The students and the teaching staff have access to the necessary resources. There is a common system and procedures for the improvement and purchase of the material, technical, methodological, and informative provision. The equipment in laboratories is suitable for research work and for educational purposes. IT infrastructure is also very good, there are computers available on campus. Library has been praised by all stakeholders with the provision of literature, IT resources and services.

RAT has developed clear procedure how to attract highly skilled teaching staff and motivate for further development in the study field and its four study programs. The needs of the teaching staff for professional and didactic improvement are identified in a target-oriented manner. The academic and research workload of the teaching staff is pretty high, but no complaints were given. In general students are satisfied with different support systems in place, they are missing more formal tutorship program and more interface with companies.

Main strengths:

1. Quality infrastructure in Rezekne in terms of building, lecture rooms, computer rooms, library and laboratories for staff and students;
2. Very good equipment in laboratories for research work as well as for students;
3. A new laser center with 15 different lasers as a great support for master and doctoral study

- program Laser technologies and an opportunity for research work and cooperation with companies;
4. Many support systems for teaching staff (trainings for didactics higher education, improving English language, voluntary evaluation of work quality, Erasmus exchanges, company internships etc.);
  5. Library provides staff and students with literature and services, e.g. scientific database, on a very high level;
  6. Ability to obtain funding for infrastructure and equipment through European funds;

Main weaknesses:

1. The extent of cooperation with industry in terms of money is rather low. The potential based on a very good equipment is much higher;
2. Students have available several support systems, but it seems they are not aware of them sufficiently (individual services of a psychologist, career counselling services, Career Portal);
3. Students would like to work on more industry / company related challenges;
4. Lack of student tutorship system.

#### **1.4. Scientific Research and Artistic Creation**

##### **Analysis**

1.4.1. RAT , as a scientific institution, was registered with the Latvian Register of Scientific Institutions in 2013. The aims of scientific activity are determined by the “Strategy of Scientific Activity of RAT 2019–2023”, which are excellence in research, popularization of research results and recognition of scientists through international scientific conferences, focusing on research and innovation policy goals defined by the EU, etc. study field tasks are focused on the implementation of RAT Strategy, which prescribes to continue development of exact study program, based on the principle in that order: science, innovation, prototype development, technology transfer, production. RAT is realizing and also planning to develop market-oriented research within the study field consequently creating new products with high added value in following research directions: laser technologies, development of new innovative materials, development of new innovative products in mechatronics, applied research in mechanics and mechanical engineering, as also electronics and telecommunications, etc.

The joint doctoral program “Laser Technologies” was started in the academic year 2021/2022 together with "Angel Kanchev" University of Ruse in Bulgaria. The number of teaching staff from the partner university is 3 people. The study program was created by eliminating the previous doctoral study program in environmental sciences and including 2 doctoral students in the new study program, but in general the new program is a logical continuation of laser technologies in the next stage after the master's study level. The number of companies in the given sector in the region is not large, but the interest in future perspective could increase with the continued successful development of the sector, incl. scientific activities in companies.

1.4.2. One of the core objectives set by the RAT Strategy is the implementation of science-based study process. It is implemented from the beginning to the end of studies – bachelor, master and doctoral study programs always include scientific research as a prerequisite to obtain a diploma.

The topics of scientific projects and research directions are directly related to the study courses and the equipment at the disposal of RAT. It allows students to get involved in certain tasks in projects. This is also confirmed by the number of students involved in individual projects. For example, in the project "Integration of Safe Technologies for Protection from Covid-19 in Healthcare and High Risk Areas" of the Government Research Program "Mitigation of Consequences of Covid-19", RAT was represented in this project by 7 persons, 4 of whom were students (3 from the Mechatronics program, 1 from the master's program in laser technology). Over the course of this project, 1

student developed his own engineering design project in mechatronics, 1 produced a Master's Thesis in laser technology. Based on these and other projects, the students have developed their own term papers, as also projects and Master's Theses. Interviews confirmed that this type of approach is interesting for students as it helps to develop genuine interest and resolve real scientific problems in industry. Therefore, it can be said that the connection between science and the study process is relatively close and is constantly evolving.

Faculty members actively pass on their experience to students, which is confirmed by the interviews. The different experiences of the teaching staff are confirmed by the fact that one study course can be conducted by several teaching staff, of whom theoretical knowledge is taught more by a representative of the academic staff, but practical - by a teaching staff with professional experience.

1.4.3. In the field of research, long-term cooperation with certain partners abroad is visible, as a result of which it has been established a joint doctoral study program Laser Technologies (RAT, "Angel Kanchev" University of Ruse in Bulgaria), which ensures involvement of international academic personnel with doctoral degrees, as well as conduces the synergy of studies and research within the study field. The chosen study fields and scientific activity in them are purposefully developed, but the international recognition could be wider, considering the modern equipment. RAT recognizes the need to increase the number of international projects and is already trying to carry out appropriate activities. For example, a project has been prepared together with German partners for Horizon 2020 program, which was rated relatively well but did not receive funding. Activities in this area are also confirmed by RAT's participation in the project "Support to international cooperation projects in research and innovations at Rezekne Academy of Technologies", which aim is to increase the research and innovative capacity of RAT, ensuring the participation of the scientific staff in international research, networking and fellowship events in the European research area and preparing at least five project applications of the program HORIZON 2020. In overall, the number of ongoing projects is not large, but clearly represents the research directions of RAT. The meeting with teaching staff showed positive mood in the preparation of projects, despite some previous failures. Academic staff and researchers from abroad also took part in the meeting, which confirms RAT's serious approach to promoting international cooperation. Some lecturers, including study program directors, actively participate in ERASMUS exchange programs (2.5. Cooperation and Internationalisation - Annex 19), thus maintaining cooperation both with existing partner universities and looking for new partners.

1.4.4. RAT develops mechanisms for the involvement of the teaching staff in scientific activities and at the moment it is regulated by the "Regulation for Scientific Activity in the RTA", which states that scientific work is a mandatory part of work of the elected academic staff at RAT. The results of the scientific work are reflected in the lecturers' scientific publications (or patents), as also projects. In order to promote the involvement of teaching staff in scientific/applied research, a motivation system is established starting from study year 2021/2022. In general, teachers express support for the introduction of such motivation system, as it is an incentive to write publications also for those teachers who were previously more focused only on teaching.

The total number of publications for elected staff is large and reaches around 600 in the reporting period (II - Description of the Study Field - 2.4. Scientific Research and Artistic Creation - Annex 15), but the number of indexed publications is much lower. A significant contribution in this area is provided by the attracted foreign lecturers, who are the leaders in the number of publications and are ahead of the RAT lecturers. Almost all faculty, with the exception of a few people from industry, have publications. There are significantly fewer publications for young teachers, which can be explained by the high workload in various projects in the RAT or in the work industry.

Besides of that Publications Support Fund has been established at RAT, where staff elected into

scientific positions can apply for financial support to cover all or part of the costs related to scientific publications.

To the extent possible, RAT also announces internal scientific grants, where it is possible to obtain start-up funding for the development of a scientific idea, which can be further developed in national and international scientific projects. Overall, this could lead to an increase in scientific activity.

The total number of different types of projects for staff involved in doctoral studies reaches 50, but difference in staff involvement is observed. Some staff members have been involved in many projects, but others have not been involved in the project for the last 5 years.

In addition, RAT organizes an international scientific and practical conference "Environment. Technology. Resources" every two years with attendance of scientists from 10 countries, which is a good opportunity for RTA researchers to publish their research. Evaluating the list of staff publications, it was possible to see that this conference is popular among RAT faculty.

The visit shows that in some study programs staff is involved in production and also in scientific activities in private companies. It gives students the opportunity to see the latest innovations in production and look for new ideas in product development. But it is possible that the workload of some of these teachers hinders the reflection of their scientific activities in the form of publications (annex 14). The equipment at the disposal of RAT is also of interest to entrepreneurs in solving some scientific problems.

1.4.5. Students are involved in science, but there is place for growth in case of the number of projects developed by RAT. RAT representatives are committed to solving this problem in the future. In overall, some study courses are directly related to solving scientific issues, for example, compulsory study course "Introduction to Research" (1 CP) for the study program of Mechanical Engineering, scientific research project in 2 semesters for the master academic study programs Laser Technologies, as well as other science-related activities in other subjects.

The 2nd level professional higher education bachelor study program of Mechatronics determines that in order to obtain the diploma, a student must have at least one publication. He/she can publish a scientific article in any scientific journal, but it could be done also in the proceedings of international scientific and practical student conference "Human. Environment. Technology.", which takes place in RAT. In order to achieve the required scientific quality of the articles, the lecturers actively participate as co-authors. However, this approach allows to gain an understanding of the publication, analysis, presentation and presentation of research results, allowing the student to understand whether in the future he/she would like to participate more in projects and other related activities.

During the on - site visit, the experts ascertained that one of the best examples is a project "Continuously variable transmission for micro-mobility vehicles", where are involved several students (2 from the study program Mechatronics, 2 from the master's study program Laser Technology, 1 from the master's study program Computer Systems). Some participants of this project are already involved in the learning process, which will further facilitate the fast and efficient transfer of newly acquired knowledge to the study environment.

As the joint doctoral program "Laser Technologies" started in the academic year 2021/2022, there is not a lot of evidence of research involvement of doctoral students, but activities are planned.

1.4.6. As an important contribution to the study process can be made to the fact that (1) students have free access to all laboratories and workshops 7 days a week for both classes and independent work; (2) students are free to receive a consultation of a professor, engineer or laboratory assistant on the same day without prior appointment; (3) students are involved in research projects or company-commissioned research. All this, combined with modern facilities and modern equipment, increases the interest of students in the learning process. It also encourages graduates to continue their studies at the master's level and to work as lecturers at RAT. In the future, it would be

desirable to promote the implementation of innovative student ideas already in projects or student start-ups. Perhaps RAT could consider creation of a pre-incubation platform available for students to start their business. Although during the interviews, graduates were named who immediately set up their own companies in the acquired specialty after graduation.

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

In general, active involvement of RAT in the development of science and research environment can be observed. The relevance of research in the field of study to the goals of RAT and industry is obvious. All the above shows this connection between the study process and science. International cooperation in the current phase is satisfactory but should be further developed in the future. RAT has developed various mechanisms for staff involvement in scientific activities (conferences, motivation system, etc.), and main results are shown in a significant number of publications, but mechanisms must be found to involve also staff whose scientific activities are insignificant and not reflected in the form of publications. It was observed missing articles in high-impact journals (Q1 and Q2). Besides of that, there is no even involvement in projects for all staff and therefore efforts should be made to encourage the involvement of less active staff in projects. RAT has developed appropriate mechanisms for the involvement of students in scientific activities without subjects - participation in conferences and projects. Innovative solutions are being implemented and new ones are constantly being introduced.

Strengths:

1. The equipment and research environment are of high quality. Ways to purchase missing equipment are regularly sought.
2. Two conferences organized by RAT allow scientists and students to publish research regardless of financial possibilities and existence of projects.
3. A motivation system that is welcomed by both staff and RAT management.

Weaknesses:

1. Relatively large number of publications, but missing articles in high-impact journals (Q1 and Q2).
2. There is no even involvement in projects for all staff. Efforts should be made to encourage the involvement of less active staff in projects.

### **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

RAT has at its disposal appropriate equipment and staff for the successful development of the given research directions.

## **1.5. Cooperation and Internationalisation**

### **Analysis**

1.5.1. As already discussed in Section 1.1, RAT's cooperation with industry partners is considered by the expert team as one of the most important strongholds of RAT's operations. Such an operating practice makes both the programs taught as well as their outputs industry relevant, timely and likely to generate significant financial effects. In the self-evaluation report the RAT outlines its formal liaisons with two higher education institutions, four professional organisations and 10 industry partners in total, which is deemed appropriate and matching the size of the RAT and the local

economy.

Despite the obvious focus on the industry and its proofreading of the RAT's academic and research accomplishments, the majority of the collaborations are exercised on very basic cooperation levels. As such, most of the cooperations presented have been set merely to provide frameworks for student internships and exchange, or to demonstrate the given industry focus from the administrative point of view by means of signed memorandums of understanding or similar cooperation agreements. An example of such a basic level cooperation agreement is provided in the document entitled as Annex 6 of the self-evaluation report regulating RAT's cooperation with the Riga Technical University.

The expert team fully appreciates the present situation at which most of the students in Latvia want to study on public universities merely because the tuition fees are lower which, coupled with the fact that the Latgale region happens to be the poorest region in Latvia, generates high expectations for external funding coming from either the regional/national government or the industry sector. However, the latter is rather reluctant to finance scholarships even though there is a clear need for highly qualified staff. In this regard, as a potential remedy to such an unfavorable situation, the expert team suggests that further efforts are invested into analyzing current and future partnership in a more "value-for-money" oriented manner. That means, if the RAT expects a partner to finance student scholarships or project grants, in the corresponding partnership proposals the HEI must clearly state concrete and measurable gains the partner would benefit from. Given the HEI's reputation of an engineering-focused institution offering unique study programs in state-of-the-art tech fields, and taking into account RAT's human and lab resources available, it is reasonable to expect the RAT would be perceived by many industry members as a desirable technology partner which in turn may lead to lucrative cooperation agreements.

In addition to being focuses on partnering with the industry and keeping a close collaboration with Rezekne and Livani municipalities, the RAT also contributes to a wider society by promoting workforce mobility and entrepreneurial mindset. With respect to the latter, in the undertaken interviews ample evidence has been collected on RAT's assistance to graduated students in setting up and overseeing their start-ups mostly via unofficial collaborating modes. Moreover, the RAT has also been open to serve as a testing ground for individual accomplishments examples of which include testing of a dedicated laser technology software developed by a graduated student and others.

Despite the omnipresent limited financial resources, the RAT remains open to both new start-ups as well as established companies for knowledge share even without the corresponding financial remuneration. Example of such an undertaking is depicted in the feedback received from a representative of the OptoElektronika SIA which suggested the company made considerable savings and tech upgrades after had been consulted by the HEI on certain technological issues. These upgrades allowed the company to sell their products in China and elsewhere, and at the same time, the given technical consultancy was provided free of charge.

1.5.2. In addition to cooperating with Latvian institutions and industry, the RAT may indeed pride itself to have been partnering respectable industry and/or institutional members from abroad. Examples of such partnerships include German ZVK GmbH, Bulgarian "Angel Kanchev" University of Ruse and others. Virtually all the partners are closely connected with the study field, and hence such cooperations for sure contributes to the achievement of the aims and learning outcomes of the study programmes taught.

To substantiate the above claims, the HEI has presented a separate document entitled "Annex 16" listing its domestic and international cooperation partners in addition to the list provided in the self-evaluation report. The latter lists 13 partners in total of which 6 partners from academia, 1 partner from professional organisations and 6 partners from the business sector. Although some may argue that such a relatively small number of partners leave considerable room for improvement and that more partnerships should be sought to support the teaching process, nevertheless, the expert team strongly feels the presented partnerships are very much a part of the corresponding academic processes and, unlike many other universities, are utilized for purposes other than mere formalization of the international cooperation requirement. This has indeed been confirmed in the interviews held. Having a General Manager of an German-headquartered international group of companies (ZVK Group) present at the evaluation session, and actively sharing his views on the ways the partnership has been exercised so far, leaves no doubts that the given partnership stands for an outstanding example of bridging the gap between academia and the business sector.

1.5.3. The HEI may be seen as to have developed an effective system to stimulate student and staff mobility. The mobility is mainly driven through the industry partnerships or by utilizing project-based frameworks such as ERASMUS, ERASMUS+, ESF and others. Through the latter, the HEI has concluded more than 170 student and lecturer exchanges since 2014. According to the self-evaluation report, the total number of visits by foreign lecturers is 63, ranging from lecturers from Germany, Poland, Bulgaria all the way to Turkey.

Even though the current liaisons with both foreign academic institutions and the industry rely heavily on individual collegial relationships, it is beyond any doubt that the partnerships set as a result of these relationships very much serve the purpose of internationalizing HEI's operations. In addition to the described in Section 1.5.1. and 1.5.2., the feedback received also confirms that industry partner representatives participate in the lecturing process as guest lecturers and they often get invited to share their most recent experiences from the industry. The latter is valued highly by the expert team given that such feedbacks guarantee high alignment of the study programs taught with industry needs. Nevertheless, none of the interviewed lecturers or industry representative has confirmed being familiar with regular industry surveys to have been planned and executed by the RAT.

In addition to the obvious implications of HEI's internationalized operating practice, the effects of student and lecturer mobility has made an immense contribution to the development of the local community too. Cultural exchange originating from students traveling to and from territories like Germany and Bulgaria as a result of the closed partnership agreements, or inward mobility of highly qualified personnel are immense and feedbacks received from the interviewed stakeholders confirm that fully. All the interviewed have exercised a "giving back to the society" attitude thus making the Rezekne region more attractive and habitable.

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

Conclusions:

1. The great majority of the agreements with the industry are formalized but most of them are of generic nature and as such they typically don't offer a counter value to the industry partner.
2. The feedback received suggests the industry has got a high demand for BSc and MSc-level graduates but has not been much prepared to finance research or scholarships. As such, it remains unclear what has been the rationale behind setting up the evaluated doctoral study programme.
3. The joint study programme has been set more as a logical follow up of an individual academic liaising rather than a result of a strategic well thought-off planing.

Strengths:

1. RAT's industry partners speak very highly of the RAT itself, its competences, operating practice and academic conduct.
2. The collaboration agreements include respectable foreign industry partners such as the German ZVK GmbH or a number of daughter companies set up locally by foreign owners.
3. The HEI promotes and exercises fully student and workforce mobility and as such take advantage of knowledge, best practice and cultural exchange via visiting lecturing, student exchange etc.

Weaknesses:

1. Despite the strong liaisons with a range of foreign partners, the RAT fails to generate significant financial value out of these cooperations.
2. High value knowledge in a rather narrow and advance tech field is often shared for free without the corresponding financial remuneration.
3. Many academics pursue their careers in the private business sector even as full time academic members of the RAT.

### **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

RAT's cooperation with industry partners is one of the most important strongholds of HEI's operations. Such an operating practice makes the study programs taught and their outputs industry relevant, timely and commercialization-potent.

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

#### **Analysis**

The RAT has fully analyzed all of the recommendations previously received during evaluations and licensing of the study field and programmes. In total there are 30 previous recommendations out of which 26 are fully implemented.

The first partially completed recommendation is regarding doctoral dissertations but as the HEI indicates the first possible dissertation could take place only in 2024 as such the implementation is not yet possible.

Second partially implemented recommendation: "Develop a system of master 's study programs (especially master' s study programs "Laser Technology") to attract graduates to doctoral studies". The HEI has shown in self evaluation and Annex 20 that even though the planned implementation date was set in 2021 further work still continues to implement this recommendation fully.

Third partially implemented recommendation: "Leading researchers upgrade their English-speaking skills from B1 level to at least level B2." During the on-site visit experts group witnessed the fact that this goal has not yet been reached, but as HEI states in Annex 20 a plan for achieving this recommendation has developed.

Fourth partially implemented recommendation: "Carry out research on similar existing study programs in a nearby region (e.g., Estonia, Lithuania, Poland) and an analysis of the possibilities for cooperation." As HEI states in annex 20 for implementing this recommendation which was given during program licensing for Doctoral study program Laser technology in 2021 the deadline has been set (which was also stated during the licensing) for 30.06.2022. where the HEI seems to be on schedule for achieving it.

Even though the recommendation on increasing the involvement of the academic staff in scientific work is taken into account and implemented, in Annex 15 it can be observed that publications overlap within the HEI and its staff. The implementation of this recommendation could be taken further increasing the amount of cross-institution cooperation in Latvia and on an international level, but it looks perspective since now RTA is realizing a joint doctoral study programme “Laser Technologies” with “Angel Kanchev” university of Ruse, so this could lead to increased count of publications.

Another aspect to be taken into account is that due to the recent licensing of (of the doctoral studies in 2021) there simply has not been enough time to fully implement the recommendations though according to the self evaluation report and the information gathered during the onsite visit all recommendations will be fully or partially implemented.

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

Conclusions:

All recommendations have been analyzed by the HEI and are fully or partially implemented. Due to recent licensing of the doctoral study programme there has not been enough time to fully implement the recommendations. Overall the HEI has treated the recommendations with high sense of responsibility and are working towards improvements.

Strengths:

1. All recommendations have either fully or partially been implemented.
2. The HEI has used an effective strategy for the implementation of the recommendations.

Weaknesses:

1. Implementation of some recommendations is still ongoing or are behind schedule.

### **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:** Partially compliant

The implementation process of recommendations is provided, but some of the recommendations have been implemented only partially.

### **1.7. Recommendations for the Study Field**

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

1. In the coming strategy development process for the 2023-2030 period., more refined analyses must be undertaken to complement the current practice and provide detailed feedback on the current market/research trends in Latvia and abroad, and hence underpin forecasting the revenue/student enrollment potential. If, for instance, developing joint study programs remains to be RAT's important development activity, any such development must be preceded by a thorough market analysis of the target geography. Such an activity must be completed in 2022 in order to be deemed relevant for any forecasting and planning targeting the period from 2023 onwards.

2. Within 1 year period introduce regular industry surveys which would seek feedback from both partnering institutions, municipalities and private sector companies, as well as from other industry members the RAT does not have a closed cooperation with. In addition to focusing on assessing the quality of the study programs taught, the surveys must be focused on analyzing revenue potentials of RAT's research and consultancy capacities.
3. Within 1 year period by upgrading current RAT regulations devise a framework which would regulate circumstances in which conflicts of interest may occur in situations where academics run their own enterprises in addition to pursuing their academic careers at the RAT.
4. Intensify the promotion of career counselling options among students - introduce student tutorship at all study program levels.
5. Seek new ways on how to include graduates in the study process after their graduation.
6. Seek new ways how to give feedback to the students and employers about the implementation of their feedback.
7. Inform students more about the possibilities provided by RAT, e.g. the career portal, chances to participate in scientific work.

### Long-term recommendations

8. The RAT should pay extra care its operational practice follows a certain business logic in addition to research interest. This is particularly relevant to resource allocation in research commercialization activities. In this regard, it is strongly recommended that all future commercialization-driven partnerships include stipulations which address relevant business and commercial benefits and outputs of both partners.
9. Consider and analyse potential of new joint study programs which would target BSc and MSc level students from financially more potent markets such as, for instance, Germany.
10. RAT management and program directors should regularly monitor the number and quality of teaching staff's publications. Appropriate mechanisms should be put in place to encourage an increase in the number of publications in cited and high-impact journals when conventional incentive mechanisms do not work.
11. Institutions responsible for science at RAT should provide with as much information as possible about participation in various projects, their benefits, financial opportunities, as well as, as far as possible, provide advice on project writing and documentation preparation.
12. Intensify communication with companies and motivate them to engage in joint R&D projects and using RAT services - apply for funding together with companies on national and international calls - design a list of possible student projects in local companies for each study year.
13. A strong emphasis should be put on rising the English proficiency level of the academic staff.
14. Develop a strategy to attract new students to the study programs.
15. Develop a strategy to attract more international students and researchers.
16. Involve students in the strategy making, as well as in the decision making process regarding the quality of study programs.
17. Introduce mid-semester surveying, to gain more data regarding the quality of study courses.

## II - "Mechanical Engineering" ASSESSMENT

### II - "Mechanical Engineering" ASSESSMENT

#### 2.1. Indicators Describing the Study Programme

##### Analysis

##### 2.1.1.

The study program Mechanical Engineering is a first level professional higher education study programme. The programme complies fully with the corresponding study field both regarding its name as well as the content. Study programs of the similar nature address engineering fundamentals and as such may be seen as of generic engineering nature. It is a first level professional program lasting two and a half years and educating mechanical engineering specialists capable primarily to provide basic logistics to various Latvian engineering-focused production industries. As such, the principal aim and the duration of the study program seem appropriate.

##### 2.1.2.

The name of study program corresponds to the code 41521 of the study program according to Latvian Education Classification (Latvian Cabinet of Ministers Regulations (Cab.Reg.) No. 322, <https://likumi.lv/ta/id/291524-noteikumi-par-latvijas-izglitiba-klasifikaciju>), meaning that first two digits `41` notes that the study program is first level professional higher education study program (level 5 of Latvian and European Qualification Framework) and the last three digits `521` notes the study program belongs to the program in "Mechanics and Metal Processing". Consequently, the awarded qualification "Mechanical Engineering Specialist" corresponds to the study program code and title.

Furthermore, the professional nature of the program and the qualification "Mechanical Engineering Specialist" corresponds to the Latvian Cab.Reg. No.141 - Regulations on the State Standard for First-Level Professional Higher Education (<https://likumi.lv/ta/id/6397-noteikumi-par-pirma-limena-profesionalas-augstakas-izglitiba-valsts-standartu>) ( Compliance with the State Education Standard - Annex 3) and to the national professional standard of "Professional standard Mechanical Engineer", approved by the Ministry of Education (No. 7, December 15, 2021) <https://registri.visc.gov.lv/profizglitiba/dokumenti/standarti/2017/PS-195.pdf> (Compliance of the qualification to be acquired upon completion of the study program with the professional standard or the requirements for professional qualification - Annex 4).

The study program is held in Latvian language. The study program is offered in a full-time studies format of the period of 2 years and 6 months in the amount of 100 Latvian study credit points or 150 ECTS.

Content-wise, to demonstrate the study program compliance with the expected outcomes, the RAT has provided a document (Annex 5) which maps the compliance level against the set of six evaluation criteria. According to this, it may be deemed that the, apart from a few modules which may be considered redundant, learning outcomes are interrelated with the program objectives. The potentially redundant modules include the "Introduction to Research", "Labour Law" (in conjunction with the "Labor Protection" module) and the "First Aid and Hygiene in the Industry". The latter may indeed be seen as subject to professional training or staff onboarding processes rather than a part of an engineering-focused study program.

Given that the study program represents an entry level higher education program, the admission requirements are straightforward and are unlikely to be a part of any major dispute.

### 2.1.3.

According to the self-evaluation report, the program sustained certain minor changes in the last assessment period but these had not have major influence on the program outputs and nature.

2.1.4. Economic and social justification of the program follows the logic and reasoning pertaining to the entire study field. The study program hence reflects the needs of the Latvian economy for qualified engineering personnel which have already been discussed in Section 1.1 quoting as many as 1.000 engineers to be sought by the Latvian metal working industry in 2020 only. (p106 of the self-evaluation report). Also, evidence providing social justification of the given program has also been received in a number of feedbacks collected via the undertaken interviews. All of them jointly agree on the fact that the study program contributes greatly to other non-engineering benefits to the local society. Also, the interviewed students somewhat confirmed the views vocalized in a separate interview with local government officials stating that with the start of the study program, more young people have chosen the region as a place of their permanent residence. Two of the attendees underpinned this even further by mentioning their personal experience of working abroad after which they've decided to return back to Latvia and continue their lives in the Livani region.

2.1.5. not applicable

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

Conclusions:

The study program educates mechanical engineering specialists capable primarily to provide basic logistics to various Latvian engineering-focused production industries. The study program objectives, title, duration and expected outcomes are well balanced and provide solid proofs to be considered both economically and socially justifiable. The programme complies fully with the corresponding study field both regarding its name as well as the content.

The learning outcomes of the study programme correspond with the programme's objectives, and the duration and scope of the study programme seem appropriate. The programme targets primarily domestic needs of entry level mechanical engineering personnel. The feedbacks received confirm high employability of the graduated students making the programme economically and socially justifiable.

Strengths:

1. Strong support by the local government
2. Excellent time-2-market ratio making graduated students quickly employable. The students vocalized getting engaged in more practical work and hence acquiring much needed practical experience to be a key competitive advantage over their colleagues from other comparable universities. As such, they get to be highly employable and able to target reasonably well paid jobs.

Weaknesses:

1. Students and graduates vocalised their unwillingness to exercise student exchange and mobility schemes.

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

### **Analysis**

2.2.1. Study program complies with the national 1st level professional higher education standard (Cabinet Regulation No. 141 Regulations Regarding the State Standard for First Level Professional

Higher Education of 20 March 2001). Courses of general education – 20 CP, industry-related training courses – 54 CP, traineeship – 16 CP, qualification work – 8 CP. Training courses with a total amount of 74 CP, which makes up 74% of the total amount of the study program. In the study process, approximately 50 % of the study courses are implemented in practice despite to 30% defined by standard.

study program complies also with the professional standard of the Mechanical Engineering Specialist (Annex 4) including also the latest requirements of the industry added in 2021.

In general, the descriptions of the study courses are prepared in good quality and include all the necessary sections. The aim, content, acquired knowledge, skills and competencies of the study courses are in line with the main goals of the study program and the outcomes to be achieved. The evaluation methods mentioned in the description of study courses are logical and aimed at achieving results. In face-to-face interviews, students confirmed that the requirements for study courses when starting their studies are clear and understandable to them. At the same time, the goals of the study program and the results to be achieved correspond to the professional standard of a Mechanical Engineering Specialist (approved by the Ministry of Education 15.12.2021).

The amount of literature used in most study courses is sufficient and relevant. It would be advisable to update the literature in separate study courses, where all required literature is older than 10 years: “Basic of design II + Course project in mechanical drive design”, “Electronics and industrial electronics equipment”. There is a relatively small number of teaching materials prepared by the staff of RAT in the list of compulsory literature. In future, it would be advisable for the staff of RAT to focus on preparing such materials.

An important shortcoming could be the inclusion of English in the section of free choice courses. Students' knowledge of English is usually quite different when starting their studies at a higher education institution, and this can hinder the acquisition of certain study courses where English terms are used intensively. However, by choosing English in the free choice section, they will no longer be able to choose some other free choice course. During the interviews with the students, it was confirmed that English would still be needed.

Courses are acquired in accordance with the generally accepted sequence, but there are some exceptions, when professional specialization courses are acquired immediately in the initial period of studies to stimulate the students' interest during the 1st and 2nd semesters in the specialty they are studying. The content of the study courses is updated in accordance with the development trends of the industry, the labour market and science, as also student preferences, which was confirmed during the experts' visit.

Analyzing the submitted program mapping, it was observed that the study courses are mutually complementary in order to achieve the goals of the study program. In general, the content of study courses is positively assessed by both students and graduates, as well as employers.

#### 2.2.2. N/A

2.2.3. The basic principles for the evaluation of the learning outcomes in RAT are based on internal documents: Regulation of Examinations and Testing Session at RAT, Methodological recommendations for organizing students' independent work at RAT, Regulations on course examinations and tests, Outcome-Based Study Quality System of RAT, Plagiarism Control and Prevention Rules at RAT.

RAT states that the principles of student-centered education in the study program are ensured in different ways, but in general by evaluating the students' previous preparedness and offering such study content that can ensure achievement of the learning outcomes of the study program the best, offering flexible ways of studies, providing students with full consultative support and full access to the study resources necessary to achieve their learning outcomes. This was also confirmed during experts' visit.

In overall, the principles of student-centered teaching have been observed in the implementation of study courses. Different teaching methods are also used in teaching study courses: lectures, practical works, laboratory works, seminars, etc. RAT also uses a method to integrate certain study courses, such as Physics, into other study courses so that students acquire not only theoretical knowledge but also practical application immediately in laboratory conditions or calculations. Sufficiently modern equipment allows to realize this option. Students appreciate such solutions, which were also confirmed by face-to-face interviews during the experts' visit.

In most study courses this proportion between lectures and practical works is as follows: lectures – 50%, practical and laboratory works – 50% of the number of contact hours. There are also specialized study courses with 90-100% of the number of contact hours devoted to practical work with the aim to acquire the skills required for the future profession. During the interviews, students positively assessed this approach.

Considering 2 study places, one of which is an hour's drive from RAT and is mainly used only for theoretical classes, the use of MS Teams in teaching lectures is highly valued by students, especially if the lectures were recorded, with the possibility for students to repeat them again. The study program in Līvāni mainly implements the theoretical part of the study plan, the experimental part is performed in Rēzēkne, which do not affect quality of the studies.

In the interviews with the students and academic staff, it was confirmed that representatives of the academic staff regularly encourage the students for the improvement of their practical skills even outside of lecture hours, thus the students are encouraged to do independent projects. If students require the assistance of teaching staff outside of lecture hours, such possibility is offered. These are one of the main principles of student centered learning, although from the interviews of students it could be noticed that students lack the information about how to begin their own projects, as well as join scientific work.

2.2.4. The practice complies with the requirements of regulatory enactments. The regulations set out in detail traineeship goals, tasks, abilities and competences, evaluation, organization and supervision, etc. The traineeships take place in the companies of metalworking, mechanical engineering and other industries, which are able to ensure completion of the tasks provided for by the traineeships. RAT has some basic agreements with traineeship places, but students have the opportunity to choose the traineeship place by themselves. Initially, the place of practice for study program students is chosen close to home in local companies, which was confirmed also by students. Usually these are companies in Latgale region, situated in Līvāni or Rēzekne.

Traineeship is planned in the final stage of the study process (end of the 4th semester, the 5th semester), when the theoretical part has been acquired and students can start full-time work in the company. RAT informs students about potential and up-to-date traineeship places offering companies that are its cooperation partners or that have informed RAT about their readiness to offer students traineeship places. The number of companies with which internship agreements have been concluded is not large, but RAT claims that the number of offered traineeship places usually exceeds the number of students. During the interviews, the students did not express any objections about the lack of internship offers or the ambiguity of the process of choosing the internship place.

The number of partner companies where students can do an internship is not large in the given study program, so it would be useful to expand the number of these companies and conclude the relevant agreements.

The aims and tasks of the traineeship (Annex 8) correspond to the learning outcomes to be achieved in the study program Mechanical Engineering.

2.2.5. N/A

2.2.6. The topics of the qualification papers are actual. The works have been performed in good

quality, in an appropriate amount, including all the necessary sections of the work. During the visit, no significant deviations from the work performance regulations were observed.

Qualification works solve real problems related to production, equipment development and modernisation, new product creation and innovation. The topicality of the themes is confirmed also by the requirement set by RAT without which qualification work is not possible to defend – the project must be developed so that it can actually be implemented in production.

The quality of the work is also confirmed by the regular control introduced by RAT. The progress of developing a qualification paper is controlled throughout the semester – regular report to supervisor at least once every 2 weeks and the director of the study program twice a semester should be sent.

The topicality of the qualification papers is also controlled in a sense by the composition of the defense commission, which includes representatives of the manufacturing industry. RAT states that representatives of the industry always openly indicate the drawbacks of the qualification work and professional competence of a specific student.

In the reporting period, engineering design projects were mostly evaluated with grades 7, 8, 9 (good, very good, excellent).

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

In overall, study program complies with the national 1st level professional higher education standard and professional standard of the Mechanical Engineering Specialist, the descriptions of the study courses are prepared in good quality and include all the necessary sections. The principles of student-centered teaching have been observed in the implementation of study courses and sufficient modern equipment helps to realize this option. The traineeship complies with the requirements of regulatory enactments and the aims and tasks of the traineeship correspond to the learning outcomes to be achieved in the study program Mechanical Engineering. The topics of the qualification papers are actual and the quality of the work is also confirmed by the regular control introduced by RAT.

Strengths:

1. Modern equipment for effective teaching of study courses.
2. Usage of a methods to integrate certain study courses into other study courses.
3. Specialized study courses with even 90-100% of the number of contact hours devoted to practical work, which was positively assessed by students.
4. Various assessment methods are used in the study courses adapted to specifics of the study course.
5. The students of the study programme are regularly encouraged by the teaching staff to improve their skillset outside of lecture time with practical projects.
6. The students of the study programme have the needed access to software that ir required in the study programme.

Weaknesses:

1. Inclusion of English in the section of elective courses in professional specialization, which prevents students from choosing some more courses that could be really useful in the speciality.
2. The list of compulsory literature sources needs to be updated more regularly, considering the rapid development of technologies in certain fields of study.
3. The students have poor information about how they can get involved into scientific work.

## **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

N/A

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

#### **Analysis**

##### 2.3.1.

The infrastructure of the RAT was described in the assessment of the study field and the description applies for the study program as well. This study program is implemented at two locations, besides Rezekne also Livani. The Livani location provides students with more theoretical lectures. For the practical work and laboratory work students travel to Rezekne. Nevertheless, classrooms, computer rooms, student office, library, even children's room are offered to students at Livani location. Academic staff has also rooms available.

##### 2.3.2. not applicable

##### 2.3.3.

Study program has a joint budget for both locations. The only additional expenses for Livani location are the rent and travel costs for academic staff. Responsible persons for this study program are satisfied with financial resources for the study program and infrastructure and equipment to implement study program. Since the large part of the laboratories and equipment is used also for other study programs, such as Mechatronics, additional cost saving are achieved.

To sum up, the study provision, scientific support, informative provision, material and technical provision, and financial provision comply with the specific features and the conditions for the implementation of the study program.

The cost of one student is sum of direct costs and indirect costs: 2772 EUR/year. The financial structure is also done at the level of the study field and it is very similar for each study program. RAT calculates the necessary number of students and income from student tuition fees to determine break even point. Study program has a stable number of students - around 80 - which makes according to RAT management this study program profitable.

The library in Rezekne provides students and academic staff with the opportunity to use computers and access different databases like LAIS, scientific journal and article collections EBSCO, ScienceDirect, Scopus, Web of Science and other. Students have the option to order missing literature. There is also a smaller library in Livani, but the students have also the option of obtaining literature from Rezekne library and national library. The overall satisfaction of students with the number and quality of titles for the study program both in Latvian and English language, was very high.

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

Conclusions:

The study program is a study program with high degree of satisfaction from all stakeholders in terms of financial resources and necessary infrastructure and equipment.

Strengths:

1. Quality infrastructure in Rezekne in terms of building, lecture rooms, computer rooms, library and laboratories for staff and students;
2. Quality infrastructure in Livani in terms of building, lecture rooms, computer rooms, library and;
3. Library provides staff and students with literature and services, e.g. scientific database, on a very high level on both locations
4. Profitable study program with stable number of students

No major weaknesses observed in regards of Resources and Provision of the Study Program.

### **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 program is a study program with high degree of satisfaction from all stakeholders in terms of financial resources and necessary infrastructure and equipment.

### **2.4. Teaching Staff**

#### **Analysis**

2.4.1. The qualification obtained by the teaching staff involved in the implementation of the study program complies with the conditions for the implementation of the study program and the requirements of regulatory enactments. The education obtained for all teachers is practically directly related to the specific field of science. Totally, 25 lecturers are involved in implementation of the study programs Mechanical Engineering and 11 of them have a doctoral degree. Lecturers with extensive professional work experience in the field are also involved in the implementation of the study program.

2.4.2. Since its licensing (2016), 8 lecturers have left the study program, where 6 of them were at retirement age. In their place, the staff of the study program was supplemented by 3 professors, 1 assistant professor, 2 guest assistant professors, 1 lecturer and 5 guest lecturers. During reporting period 1 lecturer gained the status of professor and 2 lecturers gained the status of associate professor. During the interviews, the director of the RAT study program confirmed that the quality level has not changed as a result of these changes. On the contrary – the lecturers' staff of the study program is renewed significantly as young lecturers with a new approach to the learning process have been involved. Work at RAT is offered to the best graduates of study programs. Separate professional specialisation study courses is offered to the leading specialists from the industry, who are interested in teaching and have the opportunity to find good employees for their company among the students.

Some lecturers participating in teaching more than 20 study courses, which can have some impact on workload, scientific activities, as well as the quality of those study courses. In this context, the question of the balance between teaching and research activities is relevant.

2.4.3. N/A

2.4.4. Most staff have publications in peer-reviewed journals, including international ones, over the past six years. The only exception is a couple of teachers who do not have publications, but they have a long experience in teaching a particular study course or have a practical experiences working in industry. The analysis is based on the staff CV (II - Description of the Study Field; 2.1. Management of the Study Field; Annex 11.7z) and list of publications (II - Description of the Study Field; 2.4. Scientific Research and Artistic Creation; Annex 15.docx).

2.4.5. The evaluation of the mutual cooperation of the teaching staff is most clearly visible in the preparation and teaching of the study courses. It is a common practice in RAT, that there are several (2-4) lecturers who deliver the same study course, where topics of the study course are divided among the lecturers, and in such way each could deliver his own part, but may be replaced by colleagues if it would be necessary. Cooperation between them is also actively promoted by joint work in scientific projects and commissioned research, work on joint publications and participation in conferences, joint meetings of lecturers and last semester students on the development of qualification work. Cooperation can also be facilitated by the specifics of the RAT faculty, which the experts noted during the visit - lecturers' work (office) places are located in the same or adjacent rooms.

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

In overall, the qualification obtained by the teaching staff involved in the implementation of the study program complies with the conditions for the implementation of the study program and the requirements of regulatory enactments. The qualification and research record of the teaching staff is in general on a satisfactory level. RAT takes necessary measures to ensure that changes in the number of staff do not affect the quality of studies, but the question of the balance between teaching and research activities is relevant.

The mechanism of collaboration between the teaching staff, as also information flow between the director of the StP and the teaching staff is very good. Most staff have publications in peer-reviewed journals, including international ones, but the only exception is a couple of teachers from industry. The scientific activity in terms of publishing is good, but always could be increased.

Strenghts:

1. Good communication between staff and study program director.
2. Lecturers representing industry are involved in the study process.
3. Young staff is involved in the management of laboratory and practical work.

Weaknesses:

1. Staff overload is possible for teaching staff trying to combine work at a university and one or more manufacturing companies.
2. Staff overload is possible teaching large number of study courses to individual teachers.

### **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

The qualification obtained by the teaching staff involved in the implementation of the study programme complies with the conditions for the implementation of the study programme and

the requirements of regulatory enactments.

## 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 program complies to the Latvian Cab.Reg. No.141 - Regulations on the State Standard for First-Level Professional Higher Education

(<https://likumi.lv/ta/id/6397-noteikumi-par-pirma-limena-profesionalas-augstakas-izglitibas-valsts-standartu>) ( Compliance - Annex 3)

- 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

The study program complies with professional standard of “Professional standard Mechanical Engineer”, approved by the Ministry of Education (No. 7, December 15, 2021)

<https://registri.visc.gov.lv/profizglitiba/dokumenti/standarti/2017/PS-195.pdf> (Compliance - Annex 4).

- 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 ( Annex 7) comply with regulations in the Law of Higher Education Institutions, but the materials and literature should be updated.

- 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

The provided sample of the diploma (Annex 1) complies with the procedure according to which state recognized documents of higher education are issued.

- 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

N/A

- 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

N/A

- 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

N/A

- 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

The attached CVs and confirmation in Annex 12 verify that the state language proficiency complies with the rules of Cabinet of Ministers No. 733 (Regulations Regarding the Extent of the Knowledge of the Official Language, the Procedures for Examining the Proficiency in the Official Language and the State Fee for Examining the Proficiency in the Official 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

N/A

- 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

The attached sample of study agreement (Annex 8) complies with rules of the Cabinet of Ministers. Nr. 70. (Mandatory provisions to be included in the 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 attached document in Annex 6 confirms that an agreement with Vidzemes augstskola is in place and students are provided with opportunities to continue their education in ViA study programme "Mechatronics".

- 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

The attached document in Annex 7 confirms that students are guaranteed compensation for

losses if the study program is not accredited or the study programs license is revoked due to the actions (actions or omissions) of the RAT, and the student does not wish to continue studies in another study program.

- 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

N/A

- 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

N/A

### **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

The study programme partially complies with the requirements set in national regulatory enactments, because the study materials comply with the Law of Higher education institutions, but the materials need to be updated.

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

The aims and outcomes of the study program are well defined in the documentation, as well as the outcomes for each separate study course. The professional qualification, degree and the content of the study program is interrelated, and the students are provided with reasoning why such study courses are needed in the profession. The study program both in the Līvāni branch and Rēzekne demonstrated a strong social and economic need for it. The study program complies with the professional standard of the profession. The study program has a strong equipment and informative material base, as well as knowledgeable academic staff that has a strong expertise in the industry as well. The technical and informative base is regularly updated. The academic staff is encouraged to raise their qualification.

Strengths:

1. The study program complies with the study field
2. The study program is made in accordance with national regulations
3. The study courses and their content are revised and updated every year
4. The study program has clearly defined aims and objectives of each study course
5. The study program has clearly defined aims, objectives and competencies that need to be acquired in the internship
6. The study program has a strong technical base of equipment
7. The study program is provided with a strong informative base in the library of RAT
8. The teaching staff has a good qualification, as well improves their qualification during the year with courses and practice in the industry
9. The study program is provided in the same level of quality in the branch of Līvāni and in RAT
10. The study program both in Līvāni branch and Rēzekne has a strong economic justification of why

the program is needed

Weaknesses:

11. The description of the study program is not available in the webpage of RAT
12. Materials and literature should be updated

## Evaluation of the study programme "Mechanical Engineering"

Evaluation of the study programme:

Good

## 2.6. Recommendations for the Study Programme "Mechanical Engineering"

### Short-term recommendations

1. Promote student/graduate/staff mobility schemes available such that to tackle student and graduates unwillingness to take part research exchange programs.
2. It is necessary to supplement the list of compulsory literature with newer literature sources in study courses where this has not been done.
3. Director of the study program should control the workload of the teaching staff, the number of study courses to be taught, in order to avoid a decrease in the quality of teaching.
4. Inform students about possibilities to join scientific work, as well as scientific projects.
5. Inform graduates about how they can contribute further to the RAT.

### Long-term recommendations

6. Until accreditation, it is necessary to consider the provision of English to students who have less knowledge and need to acquire it.

## II - "Mechatronics" ASSESSMENT

### II - "Mechatronics" ASSESSMENT

#### 2.1. Indicators Describing the Study Programme

##### Analysis

##### 2.1.1.

The study programme Mechatronics is a professional bachelor study programme. It complies fully with the corresponding study field both regarding its name as well as the content. Similar to the Mechanical Engineering first level professional higher education study program, the given program also addresses engineering fundamentals and as such may be seen as of generic engineering nature.

##### 2.1.2.

The name of study program corresponds to the code 42521 of the study program according to Latvian Education Classification (Latvian Cabinet of Ministers Regulations (Cab,Reg.) No. 322, <https://likumi.lv/ta/id/291524-noteikumi-par-latvijas-izglitiba-klasifikaciju>), meaning that first two

digits `42` notes that the study program is Second level professional higher education study program (level 6 of Latvian and European Qualification Framework) and the last three digits `521` notes the study program belongs to the program in "Mechanics and Metal Processing". Consequently, the awarded degree "Professional bachelor's degree in mechatronics" and qualification "Mechatronics Engineer" corresponds to the study program code and title.

Furthermore, the professional nature of the program and the qualification "Mechatronics Engineer" corresponds to the Latvian Cab.Reg. No.512 - Regulations on the State Standard for Second-Level Professional Higher Education (<https://likumi.lv/ta/id/268761-noteikumi-par-otra-limena-profesionalas-augstakas-izglitibas-valsts-standardu>) ( Compliance with the State Education Standard - Annex 3) and to the national professional standard of "MECHATRONIC ENGINEER PROFESSIONAL STANDARD", approved by the Ministry of Education (No. 1, February 9, 2022) <https://registri.visc.gov.lv/profizglitiba/dokumenti/standarti/2017/PS-210.pdf> (Compliance of the qualification to be acquired upon completion of the study program with the professional standard or the requirements for professional qualification - Annex 4).

The study program is held in Latvian and English language. The study program is offered in a full-time studies format of the period of 4 years in the amount of 160 Latvian study credit points or 240 ECTS.

The given study program is a professional bachelor degree engineering program lasting four years and educating mechatronics engineers capable to develop, run and maintain various mechatronics systems to the benefit of the Latvian production industries. The principal aim and the duration of the study program both seem appropriate.

Content-wise, to demonstrate the study program compliance with the expected outcomes, the HEI has provided a document (Annex 5) which maps the compliance level against the set of six evaluation criteria. According to this, it may be deemed that the, apart from a few modules which may be considered redundant, learning outcomes are interrelated with the program objectives. The potentially redundant modules include the "Introduction to Research", "Labour Law" (in conjunction with the "Labor Protection" module) and the "First Aid and Hygiene in the Industry". The latter may indeed be seen as subject to professional training or staff onboarding processes rather than a part of an engineering-focused study program.

#### 2.1.3.

According to the self-evaluation report (p105) The study program has been running since 2007 and admission requirements have not been a subject of any recent major change. As such it is reasonable to assume they are unlikely to be a part of any major dispute.

#### 2.1.4.

Economic and social justification of the program follows the logic and reasoning pertaining to the entire study field. The study program hence reflects the needs of the Latvian economy for qualified engineering personnel which have already been discussed in Section 1.1 quoting as many as 1.000 engineers to be sought by the Latvian metal working industry in 2020 only. (p106 of the self-evaluation report). Also, evidence providing social justification of the given program has also been received in a number of feedbacks collected via the undertaken interviews.

2.1.5. The RAT does not offer the given study program as joint study undertaking.

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

### Conclusions:

The study program educates mechatronics engineers capable to develop, run and maintain various mechatronics systems to the benefit of the Latvian production industries. The study program objectives, title, duration and expected outcomes are well balanced and provide solid proofs to be considered both economically and socially justifiable.

### Strengths:

1. Excellent time-2-market ratio making graduated students quickly employable. The students vocalized getting engaged in more practical work and hence acquiring much needed practical experience to be a key competitive advantage over their colleagues from other comparable universities. As such, they get to be highly employable and able to target reasonably well paid jobs.

### Weaknesses:

1. None

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

### **Analysis**

2.2.1. Study program complies with the Cabinet Regulation No. 512 Regulations Regarding the State Standard for Second Level Professional Higher Education of 26 August 2014. Study courses of general education are in the amount of 20 CP, basic theoretical courses in the industry and information technology courses – 37 CP, industry-related professional specialization courses in amount of 63 CP, elective study courses (free choice courses) in the amount of 6 CP, engineering design project, its development and defense – 14 CP. Therefore, volume of the study program in credit points contains 160 CP (Annex 6), where study courses contains 120 CP. In the study program, which is implemented in English, the amount of professional industry-specialization courses is 61 CP, and the vacated 2 CP are intended for learning the Latvian language. The distribution of study courses by semesters is equable, 20 CP in each semester. Most of the study courses are led by 2-3 teaching staff, which allows to ensure diversity in the teaching of study material.

Study program fully complies with the national education standard (Annex 3) and the professional standard of the MECHATRONIC ENGINEER PROFESSIONAL STANDARD”, approved by the Ministry of Education (No. 1, February 9, 2022) (Annex 4). This is also connected with the fact that the director of study program Mechatronics worked as an expert in the MASOC (Association of Mechanical Engineering and Metalworking Industries of Latvia) for developing the professional standard. Therefore this study program was revised based on the latest requirements of the industry partners. The descriptions of the study courses also define the outcomes of the study program, which are harmonised with the professional standards.

In general, the descriptions of the study courses are prepared in good quality and include all the necessary sections. The aim, content, acquired knowledge, skills and competencies of the study courses are in line with the main goals of the study program and the outcomes to be achieved. The evaluation methods mentioned in the description of study courses are logical and aimed at achieving results. In face-to-face interviews, students confirmed that the requirements for study courses when starting their studies are clear and understandable to them.

The content of the study courses is updated in accordance with the development trends of the industry and science, but during detailed analysis of the study course programs, it was established that there are study courses where the required literature is older than 10 years: “Electronics and industrial electronics equipment”, “Robotic control systems”, “Technics and programming of microcontrollers I and II”, “Telecommunication systems”, “Design of computer control systems +

Course project in computer control systems design”, etc. These are study courses, the content of which changes quite rapidly due to the development of technologies, so the improvement of the bibliography would be recommended. In some cases, updating of additional literature would also be recommended. Besides of that, there is a relatively small number of teaching materials prepared by the staff of RAT in the list of compulsory literature. In the future, it would be advisable for the staff of RAT to focus on preparing such materials.

An important shortcoming could be the inclusion of English in the section of free choice courses. Students' knowledge of English is usually quite different when starting their studies at a higher education institution, and this can hinder the acquisition of certain study courses where English terms are used intensively. However, by choosing English in the free choice section, they will no longer be able to choose some other free choice course.

Analyzing the submitted program mapping, it was observed that the study courses are mutually complementary in order to achieve the goals of the study program. In general, the content of study courses is positively assessed by both students and graduates, as well as employers.

### 2.2.2. N/A

2.2.3. The basic principles for the evaluation of the learning outcomes in RAT are based on internal documents: Regulation of Examinations and Testing Session at RAT , Methodological recommendations for organizing students' independent work at RAT , Regulations on course examinations and tests, Outcome-Based Study Quality System of RAT , Plagiarism Control and Prevention Rules at RAT.

RAT states that the principles of student-centered education in the study program are ensured in different ways, but in generally by evaluating the students' previous preparedness and offering such study content that can ensure achievement of the learning outcomes of the study program the best, offering flexible ways of studies, providing students with full consultative support and full access to the study resources necessary to achieve their learning outcomes. This was also confirmed during experts' visit.

In overall, the principles of student-centered teaching have been observed in the implementation of study courses. Different teaching methods are also used in teaching study courses: lectures, practical works, laboratory works, seminars, etc. RAT also uses a method to integrate certain study courses into other study courses so that students acquire not only theoretical knowledge but also practical application immediately in laboratory conditions or calculations. Sufficiently modern equipment allows to realize this option. Students appreciate different approaches in the teaching, which was confirmed by face-to-face interviews during the experts' visit.

In most study courses this proportion between lectures and practical works is as follows: lectures – 50%, practical and laboratory works – 50% of the number of contact hours. There are also specialized study courses with 90-100% of the number of contact hours devoted to practical work with the aim to acquire the skills required for the future profession. The proportion between the lectures and the hours devoted to practical classes or laboratory work is determined by the lecturer of the specific study course. During the interviews, students positively assessed this approach and even expressed a desire to increase the number of practical hours in individual study courses.

As a positive innovation, RAT has introduced the practice that during the semester student can earn 40% (but in other study courses even 80% and 100%) of the exam mark, which stimulates students to study the content of the study course regularly throughout the semester, instead of leaving it for the duration of the exam session. The individual approach of teachers is also assessed for employed students – in such way they can also perform laboratory and practical work on Saturdays and Sundays (together with other groups) or individually (in agreement with the lecturer).

The English language skills of some teachers should be improved in additional courses, as this may affect the acquisition of industry-specific terms and features. But in general, most of the staff's

existing English language skills may be sufficient for the implementation of the study program.

2.2.4. The study program provides two type traineeships: Production traineeship (16 working weeks) and Pre-diploma traineeship (4 working weeks). The traineeship complies with the requirements of regulatory enactments. The regulations set out in detail traineeship goals, tasks, abilities and competences, evaluation, organization and supervision, etc. Everything is explained in detail, therefore there are no objections.

It was found positive that traineeships are planned in the final stage of the study process (7th and 8th semester), when the theoretical part has been acquired. During this time, students can already focus on the practical side and apply the newly acquired knowledge.

RAT informs students about potential and up-to-date traineeship places offering companies that are its cooperation partners or that have informed RAT about their readiness to offer students traineeship places. Students usually choose an internship that could be their potential work place in the future. Traineeships take place in Latvian or foreign companies that use mechatronic equipment and/or CNC/ CAD/ CAM technologies in the production or designing process. The number of companies with which internship agreements have been concluded is not large, but RAT claims that the number of offered traineeship places usually exceeds the number of students.

Initially, student looks for and chooses a traineeship by himself, including foreign companies, but if necessary, the Faculty of Engineering and the External Relations Department of RAT provides help to the student in finding the traineeship place. In exceptional cases (for example, in case of foreign students), the traineeship can also take place at the Metalworking and Mechatronics Research Centre or the Physical Processes and Laser Technologies Research Centre of RAT , as the staff and existing equipment can ensure completion of all the traineeship tasks.

The number of partner companies where students can do an internship is not large in the given study program, so it would be useful to expand the number of these companies and conclude the relevant agreements.

In overall, the aims and tasks of the traineeships correspond to the learning outcomes to be achieved in the study program Mechatronics.

2.2.5. N/A

2.2.6. The topics of the qualification papers are actual, and some of them are very innovative. The works have been performed in good quality, in an appropriate amount, including all the necessary sections of the work. During the visit, no significant deviations from the work performance regulations were observed.

The final work in the study program is an engineering design project, which can be development of a real mechatronic equipment, development of a technological line consisting of mechatronic equipment, modernisation of a technological line, development of a new product prototype, etc. The topicality of the themes is confirmed by the requirement set by RAT without which qualification work is not possible to defend - the project must be developed so that it can actually be implemented in production.

RAT states that great part of the engineering design projects is developed together with production companies in such way solving real problems related to production, equipment development and modernisation. During the visit, the employers confirmed the quality of education acquired by RAT graduates and expressed a desire to admit new employees from the RAT graduates, which shows that students are able to solve the assigned engineering problems.

The quality of the work is also confirmed by the regular control introduced by RAT. The progress of developing a qualification paper is controlled throughout the semester - regular report to supervisor at least once every 2 weeks and the director of the study program twice a semester.

The topicality of the works is also controlled in a sense by the composition of the defense

commission, which includes representatives of the manufacturing industry. RAT states that representatives of the industry always openly indicate the drawbacks of the qualification work and professional competence of a specific student.

In the reporting period, engineering design projects were mostly evaluated with grades 7, 8, 9 (good, very good, excellent) with some engineering design projects with grade 6 (almost good) and some - with 10 (outstanding). Consequently, there are no significant objections or suggestions from experts in this regard.

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

In overall, study program complies with the Cabinet Regulation No. 512 Regulations Regarding the State Standard for Second Level Professional Higher Education of 26 August 2014. The content of study courses and its implementation can be assessed as good. It meets industry requirements and scientific trends. An important shortcoming could be the inclusion of English in the section of free choice courses. The principles of student-centered teaching have been observed in the implementation of study courses. The traineeship complies with the requirements of regulatory enactments. The topics of the qualification papers are actual, and some of them are very innovative and positively assessed.

Strengths:

1. Modern equipment for effective teaching of study courses.
2. Usage of methods to integrate certain study courses into other study courses.
3. Specialized study courses with even 90-100% of the number of contact hours devoted to practical work, which was positively assessed by students.
4. Various assessment methods are used in the study courses adapted to specifics of the study course.

Weaknesses:

1. Inclusion of English in the section of elective courses in professional specialization, which prevents students from choosing some more courses that could be really useful in the specialty.
2. The list of compulsory literature sources needs to be updated more regularly, considering the rapid development of technologies in certain fields of study.

### **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

N/A

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

### **Analysis**

2.3.1.

The infrastructure of the RAT was described in the assessment of the study field and the description applies for the study program "Mechatronics" as well. Responsible persons for this study program are satisfied with financial resources for the study program and infrastructure and equipment to implement study program. Since the large part of the laboratories and equipment is used also for other study programs, such as Mechanical Engineering, additional cost saving are achieved.

The study provision, scientific support, informative provision, material and technical provision, and financial provision comply with the specific features and the conditions for the implementation of the study program.

2.3.2. not applicable

2.3.3.

The cost of one student is sum of direct costs and indirect costs: 2772 EUR/year. The financial structure is also done at the level of the study field and it is very similar for each study program. RAT calculates the necessary number of students and income from student tuition fees to determine break even point. Study program has a stable number of students - around 85 - which makes according to RAT management this study program profitable.

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

Conclusions:

The study program is a study program with high degree of satisfaction from all stakeholders in terms of financial resources and necessary infrastructure and equipment.

Strengths:

1. Quality infrastructure in terms of building, lecture rooms, computer rooms, library and laboratories for staff and students;
2. Library provides staff and students with literature and services, e.g. scientific database, on a very high level;
3. Profitable study program with stable number of students.

No major weaknesses observed in regards of Resources and Provision of the Study Program.

### **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 program is a study program with high degree of satisfaction from all stakeholders in terms of financial resources and necessary infrastructure and equipment.

## **2.4. Teaching Staff**

### **Analysis**

2.4.1. The qualification obtained by the teaching staff involved in the implementation of the study program complies with the conditions for the implementation of the study program and the requirements of regulatory enactments. The education obtained for all teachers is practically directly related to the specific field of science. Totally, 38 lecturers are involved in implementation of the study programs Mechatronics and 20 of them have a doctoral degree. Lecturers with extensive professional work experience in the field are also involved in the implementation of the study program.

The English language skills of some teachers should be improved in additional courses, as this may affect the acquisition of industry-specific terms and features. But in general, most of the staff's

existing English language skills may be sufficient for the implementation of the study program.

2.4.2. During the reporting period, 8 lecturers have left the study program, where 6 of them were at retirement age. In their place, the staff of the study program was supplemented by 2 professors, 3 guest professors (from Germany, Bulgaria, Italy), 1 associate professor, 1 assistant professor, 3 guest assistant professors, 1 lecturer and 5 guest lecturers. During reporting period 3 lecturers gained the status of professor and 2 lecturers gained the status of associate professor.

During the interviews, the director of the RAT study program confirmed that the quality level has not decreased as a result of these changes. On the contrary, attracting of 3 foreign visiting professors could improve significantly the quality of studies. At the same time, new lecturers are being attracted from the graduates. Work at RAT is offered to the best graduates of study programs. Separate professional specialization study courses are offered to the leading specialists from the industry, who are interested in teaching and have the opportunity to find good employees for their companies among the students.

Some lecturers participating in teaching more than 20 study courses, which can have some impact on workload, scientific activities, as well as the quality of those study courses. In this context, the question of the balance between teaching and research activities is relevant.

2.4.3. N/A

2.4.4. Most staff have publications in peer-reviewed journals, including international ones, over the past six years. The only exception is a couple of teachers who do not have publications, but they have a long experience in teaching a particular study course or have a practical experiences working in industry.

2.4.5. The evaluation of the mutual cooperation of the teaching staff is most clearly visible in the preparation and teaching of the study courses. It is a common practice in RAT, that there are several (2-4) lecturers who deliver the same study course, where topics of the study course are divided among the lecturers, and in such way each could deliver his own part, but may be replaced by colleagues if it would be necessary. Cooperation between them is also actively promoted by joint work in scientific projects and commissioned research, work on joint publications and participation in conferences, joint meetings of lecturers and last semester students on the development of qualification work. Cooperation can also be facilitated by the specifics of the RAT faculty, which the experts noted during the visit - lecturers' work (office) places are located in the same or adjacent rooms.

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

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

Strengths:

1. Good communication between staff and study program director.
2. Lecturers representing industry are involved in the study process.
3. Young staff is involved in the management of laboratory and practical work.

Weaknesses:

1. Staff overload is possible for teaching staff trying to combine work at a university and one or more

manufacturing companies.

2. Staff overload is possible teaching a large number of study courses to individual teachers.

### **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

The qualification obtained by the teaching staff involved in the implementation of the study program complies with the conditions for the implementation of the study program and the requirements of regulatory enactments.

### **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 is designed according to the Cab.Reg. No.512 - Regulations on the State Standard for Second-Level Professional Higher Education (<https://likumi.lv/ta/id/268761-noteikumi-par-otra-limena-profesionalas-augstakas-izglitiba-valsts-standartu>) ( Compliance - Annex 3)

- 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

The study program complies with the professional standard of "MECHATRONIC ENGINEER PROFESSIONAL STANDARD", approved by the Ministry of Education (No. 1, February 9, 2022) <https://registri.visc.gov.lv/profizglitiba/dokumenti/standarti/2017/PS-210.pdf> (Compliance - Annex 4).

- 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

The descriptions and materials (Annex 7) comply with the regulations set in the Law of higher education institutions, but the materials and literature should be updated.

- 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

The provided sample of the diploma (Annex 1) complies with the procedure according to which state recognised documents of higher education are issued.

- 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

N/A

- 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

N/A

- 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

N/A

- 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

The attached CVs and confirmation in Annex 12 verify that the state language proficiency complies with the rules of Cabinet of Ministers No. 733 (Regulations Regarding the Extent of the Knowledge of the Official Language, the Procedures for Examining the Proficiency in the Official Language and the State Fee for Examining the Proficiency in the Official 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:** Partially compliant

The attached confirmation in Annex 13 verifies that the English language proficiency of academic staff is at least B2 level. In some of the CVs it is noticeable that some of the academic staff have a lower English proficiency level in one or two sections (e.g. writing, speaking), as well as during the expert groups visit it was noticed that some of the teaching staff, including the programme director, has a lower English proficiency than B2.

- 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

The attached sample of study agreement (Annex 8) complies with rules of the Cabinet of Ministers. Nr. 70. (Mandatory provisions to be included in the 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 attached document in Annex 6 confirms that an agreement with Riga Technical university is in place and students will be provided with opportunities to continue their education in RTU study programme "Mechatronics".

- 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

The attached document in Annex 7 confirms that students are guaranteed compensation for losses if the study program is not accredited or the study programs license is revoked due to the actions (actions or omissions) of the RAT, and if the student does not wish to continue studies in another study programme.

- 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

N/A

- 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

N/A

### **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

The study program complies with the requirements set in national regulatory enactments, but some representatives of the academic staff do not have the proficiency of English language skills of the level B2 or higher. As well as the study materials comply with the Law of Higher education institutions, but the materials need to be updated.

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

The aims and outcomes of the study program are well defined in the provided documentation, as well as the outcomes for each separate study course. The professional qualification, degree and the content of the study program is interrelated, and the students are provided with reasoning why such study courses are needed in the profession. The study program is realized both in Latvian and English languages, but the demonstrated skills of some representatives of English language skills, are not B2 level or higher so it remains unclear whether the English program is delivered in a good

quality or not. The study program complies with the professional standard of the profession. The study program has a strong equipment and informative material base, as well as knowledgeable academic staff that has a strong expertise in the industry as well. The technical base is regularly updated according to the needs of students and industry. The academic staff is encouraged to raise their qualification as well as participate in various mobilities.

Strengths:

1. The study program complies with the study field
2. The study program is made in accordance with national regulations
3. The study courses and their content are revised and updated every year
4. The study program has clearly defined aims and objectives of each study course
5. The study program has clearly defined aims, objectives and competencies that need to be acquired in the internship
6. The study program has a strong technical base of equipment
7. The study program is provided with a strong informative base in the library of RAT
8. The teaching staff has a good qualification, as well improves their qualification during the year with courses, mobility and practice in the industry

Weaknesses:

1. The description of the study program is not available in the webpage of RAT.
2. The English language skills of some representatives of the academic staff, do not comply with level B2 or higher.
3. The study course materials need to be updated.

### **Evaluation of the study programme "Mechatronics"**

Evaluation of the study programme:

Good

### **2.6. Recommendations for the Study Programme "Mechatronics"**

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

1. It is necessary to supplement the list of compulsory literature with newer literature sources in study courses where this has not been done.
2. Director of the study program should control the workload of the teaching staff, the number of study courses to be taught, in order to avoid a decrease in the quality of teaching.

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

3. Until accreditation, it is necessary to consider the provision of English to students who have less knowledge and need to acquire it.

## **II - "Laser Technologies" ASSESSMENT**

### **II - "Laser Technologies" ASSESSMENT**

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

## Analysis

### 2.1.1.

The study program Laser Technologies is an academic master study programme. The programme complies fully with the corresponding study field both regarding its name as well as the content. The study program complements the list of engineering program taught by the RAT and unlike the BSc or first level professional higher education study program , it provides advanced set of knowledge, skills and competences in highly technology oriented disciplines such as the laser and photonics engineering.

### 2.1.2.

The name of study program corresponds to the code 45521 of the study program according to Latvian Education Classification (Latvian Cabinet of Ministers Regulations (Cab,Reg.) No. 322, <https://likumi.lv/ta/id/291524-noteikumi-par-latvijas-izglitiba-klasifikaciju>), meaning that first two digits `45` notes that the study program is Academic education (master's degree) study program (level 7 of Latvian and European Qualification Framework) and the last three digits `521` notes the study program belongs to the program in “Mechanics and Metal Processing”.

Consequently, the awarded degree “Master’s degree of engineering in mechanics and metalworking” corresponds to the study program code and title.

Furthermore, the awarded degree “Master’s degree of engineering in mechanics and metalworking” corresponds to the Cabinet of Ministers Regulation 13.05.2014. No. 240 “Regulations on the State Standard for the Academic Education” <https://likumi.lv/doc.php?id=266187> ( Compliance with the State Education Standard - Annex 4).

The study program is held in Latvian and English language. The study program is offered in a full-time studies format of the period of 2 years in the amount of 80 Latvian study credit points or 120 ECTS.

The given study program is an academic master study program in engineering lasting two years and educating engineers capable to demonstrate advanced globally applicable knowledge and understanding both in the relatively narrow field of laser technologies as well as in general mechanical engineering. The principal aim and the duration of the study program both seem appropriate.

### 2.1.3.

The study program has been running since 2015 and has been updated continuously such that reflect latest trends in mechanical engineering and photonics industry since. Given the nature of the program , and given the fact that in 2021 as much as 50% of the 1st year students were of foreign origin, the admission procedure includes student ranking with respect to their accomplishments in STEM related disciplines as well as with respect to their English/German literacy. In addition, extra points are awarded to prospective students who authored papers in scientific publications or professional journals. The admission requirements have not been a subject of any major recent change and as such it is reasonable to assume they are unlikely to be a part of any major dispute.

2.1.4. As has been the case with the BSc and first level professional higher education study program in engineering taught by the RAT, the economic and social justification of the program also follows the logic and reasoning pertaining to the entire study field. Nevertheless, as a state-of-the art study program targeting a very narrow technology area, the program recognizes the immense potential of the given technology in 21st century industries, research and business. As stated in the self-evaluation report, modern lasers are high-performance instruments with the widest range of applications which have been utilized in production industry for decades. The constant need for even

more precise engineering is expected to generate even greater need for highly specialized laser technology professionals, and the given program recognizes such a potential fully.

In addition to its economic justification, it is beyond any doubt that such an advanced study program generate a wide range of positive spin-off effects in wider society. Many of them are directly related to the programs potential to attract highly educated young people to take part in the RAT,s research or academic offering. As such, the RAT should be complimented for wise strategic thinking and doing.

2.1.5. The RAT does not offer the given study program as joint study undertaking.

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

Conclusions:

The study program complements the list of engineering program taught by the RAT and educates highly qualified engineering professionals providing them with an advanced set of knowledge, skills and competences in highly technology oriented disciplines such as the laser and photonics engineering. The study program may indeed be considered a state-of-the-art program which corresponds to the needs of the 21st century industry and even though it has been a reasonably new program , it has already been recognized by both Latvian and international industry members.

Strengths:

1. Reputation and success in a very competitive hi-tech discipline offers immense potential for future growth
2. Liaisons with respectable international partners
3. Geographical closeness to very potent markets such as Germany, Scandinavia and others.

Weaknesses:

None

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

### **Analysis**

2.2.1. Study program meets Cabinet of Ministers Regulation 13.05.2014. No. 240 "Regulations on the State Standard for the Academic Education". A separate nuance is that Part A of the study plan submitted by RAT contains a master's thesis, and it is included in the total amount of CP, which would be desirable to separate in order to clearly see the amount of CP in Part A.

The content of the study program corresponds to the given specialty and is prepared in accordance with the development trends of the industry, labor market and science. The study courses are arranged sequentially by semesters (20 CP each), allowing gradually move from the compulsory part to the professional study courses. In the optional part (C part), the German language is offered in amount of 6 CP in total, but the Latvian language (for foreign students) in the amount of only 2 CP, which shows that foreign students have less time to learn the Latvian language, thus less opportunities to integrate into the study environment. Attention is also drawn to the fact that there is no English language in study course plan at all, which is important for students who are starting their master's studies in such a unique specialty (there are no bachelor's studies in such a specialty in Latvia) and who need to learn industry-specific terms. If it is possible to learn English (as mentioned in the description of accreditation documents), then such a study course must appear in the study plan. So far, there is only German.

A significant advantage is cooperation with Mittweida University in Germany, which will give students opportunity to choose also other study courses of interest in the partner higher education institution.

In general, the descriptions of the most study courses are prepared in good quality and include all the necessary sections. The aim, content, acquired knowledge, skills and competencies of the study courses are in line with the main goals of the study program and the outcomes to be achieved. The evaluation methods mentioned in the description of study courses are logical and aimed at achieving results. In face-to-face interviews, students confirmed that the requirements for study courses when starting their studies are clear and understandable to them.

The content of the study courses is updated in accordance with the development trends of the industry and science, but during a detailed analysis of the study course programs, it was established that there are study courses where the required literature is older than 10 years: "Innovation Management", "Micro and nanotechnologies", "Modelling and optimisation of technological processes", "Project Management", "Physical analytics", etc. These are study courses, the content of which changes quite rapidly due to the development of technologies, so the improvement of the bibliography would be recommended. In some cases, updating of additional literature would also be recommended.

Besides of that study course "Scientific research project I/II" does not contain any information on learning outcomes and their assessment, course content, requirements for awarding credit points, etc. Study course "Risk management" does not contain requirements of the study course acquisition start. Study course "Innovation Management" does not contain number of lectures / practical works on each relevant topic.

The study plan contains the study course "Master's Thesis", but there is no file in the study course folder that contains a description of this study course.

Besides of that students do not receive relevant feedback regarding students recommendations and its implementation in the study program.

Analyzing the submitted program mapping, it was observed that the study courses are mutually complementary in order to achieve the goals of the study program. In general, the content of study courses is positively assessed by both students and graduates, as well as employers.

During the experts' visits interviews with the students, the students stated that they do not see clear interconnection between management and economical study courses with the technical study courses. Even though students should include an economical analysis of their developed product, a larger emphasis should be put on explaining the interconnection during the semester.

2.2.2. In the study program the award of a master's degree of engineering in mechanics and metalworking is based on the achievements and findings of the respective field of science. The Master's student conducts research in the field of Mechanical Engineering in one of the sub-sectors for 3 semesters in Mechanical engineering technology (specialisation in laser processing of materials; specialisation in modelling and optimisation of laser processes; specialisation in organisation of production related to laser technologies) and Machine design (specialisation in designing of laser equipment).

2.2.3. RAT states that the principles of student-centered education in the study program are ensured in different ways, but in generally by evaluating the students' previous preparedness and offering such study content that can ensure achievement of the learning outcomes of the study program the best, offering flexible ways of studies, providing students with full consultative support and full access to the study resources necessary to achieve their learning outcomes. This was also confirmed during experts' visit.

In overall, the principles of student-centered teaching have been observed in the implementation of study courses. Different teaching methods are also used in teaching study courses: lectures,

workshops, laboratory works and students' independent work. The proportion between lectures and practical classes or hours devoted to laboratory work is determined by the lecturer of the particular study course. In most study courses this proportion is as follows: lectures – 50%, practical and laboratory works – 50% of the number of contact hours. The types of students' independent work are defined in the program of the specific study course.

RAT has introduced the practice that during the semester a student can earn 40% (or even 80% in some subjects) of the total evaluation completing all independent works and practical works of the study course thus stimulating students to study sequentially throughout the semester. Students also have the opportunity to do laboratory and practical works individually.

As the study program is offered for implementation in English then the integration of foreign students into Latvian student environment is also carried out. Lectures for foreign students are organized separately, practical works – together with the Latvian students or individually.

In the interviews with the students and academic staff, it was confirmed that representatives of the academic staff regularly encourage the students for the improvement of their practical skills even outside of lecture hours, thus the students are encouraged to do independent projects. If students require the assistance of teaching staff outside of lecture hours, such possibility is offered. These are one of the main principles of student centered learning, although in the experts visit there was no clear information on safety regulations and procedure on what happens if a student would get injured during the process of working on their independent projects.

In general, all the above allows to achieve the set goals of study programs effectively, which is also confirmed by meetings on place with students and the program director.

The English language skills of some teachers should be improved in additional courses, as this may affect the acquisition of industry-specific terms and features. But in general, most of the staff's existing English language skills may be sufficient for the implementation of the study program.

2.2.4. N/A

2.2.5. N/A

2.2.6. In general, the topics of the master's thesis are actual and in demand in production. Students develop a master's thesis in accordance with the Methodological Recommendations approved by the Council of the Study Field for development of a master's thesis, which provide that the topic of a master's thesis should be topical and it should solve important tasks related to the use of laser technologies in the field of mechanics and metalworking.

The topics of the master's theses deal with such important issues in laser technologies as the use of laser ablation: for creating Braille writing and alphanumeric characters on polyvinyl chloride, for removal of the copper layer for PCB plates; for the processing of birch plywood; in the microparticle filler manufacturing process, etc. The works also cover the topics concerning the general optimisation challenges in laser cutting, laser hardening, laser micromarking, laser sublimation, and laser processing.

RAT has in place the Rector's order 4-5/100 dated 2 December 2012 providing for the requirement to obligatory use in design of master projects the latest scientific journals in the field and scientific articles from internationally recognised databases in English. In this way, master students get acquainted with the latest scientific discoveries and apply the latest solutions in solving the problems of the specific industry. The topicality of the master's thesis topics was also confirmed by employers in online interviews during the visit. Experts do not complain about the topicality of the given topics.

The quality of the works is also confirmed by marks. Since 2017, twenty master's theses have been developed and defended in the study program. evaluated with good (7) (1 master's thesis), very good (8) (4 theses) and excellent (9) (15 theses).

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

In overall, the content of the study program corresponds to the given specialty and is prepared in accordance with the development trends of the industry, labor market and science. Therefore content of study courses and its implementation can be assessed as good. It meets industry requirements and scientific trends. The principles of student-centered teaching have been observed in the implementation of study courses and different teaching methods are also used in teaching study courses: lectures, workshops, laboratory works and students' independent work. The topics of the master's thesis are actual and in demand in production, and positively evaluated.

Strengths:

1. Modern equipment for effective teaching of study courses.
2. Cooperation with foreign teaching staff in the training process.
3. Lecturers involved from industry.
4. The students of the study programme are regularly encouraged by the teaching staff to improve their skillset outside of lecture time with practical projects, international contests.

Weaknesses:

1. It is not clear how and whether student surveys affect the improvement content of study courses - no relevant feedback regarding students recommendations and its implementation in the study programme.
2. The list of compulsory literature sources needs to be updated more regularly, considering the rapid development of technologies in certain fields of study.
3. Students do not see the aim of economic and management subjects in the study programme, lack of information why these courses are included in the study programme and how will they help in the future.
4. No clear information provided regarding what happens if a student gets injured in the laser centre outside of lecture times.

## 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 content of the study program corresponds to the given specialty and is prepared in accordance with the development trends of the industry, labor market and science.

## 2.3. Resources and Provision of the Study Programme

### Analysis

#### 2.3.1.

The infrastructure of the RAT was described in the assessment of the study field and the description applies for the study program "Laser technologies" as well. We must emphasize the latest infrastructure and equipment acquisition - laser center - that provides researchers, academic staff and students with state-of-the art conditions to engage into research and educational work. This center includes 15 different lasers, such as lasers for hardening and welding, solid-state lasers, fibre-optics lasers, CO2 lasers etc.

#### 2.3.2. no applicable

### 2.3.3.

Responsible persons for this study program are satisfied with financial resources for the study program and infrastructure and equipment to implement study program.

The study provision, scientific support, informative provision, material and technical provision, and financial provision comply with the specific features and the conditions for the implementation of the study program.

The cost of one student is sum of direct costs and indirect costs: 4157 EUR/year. The financial structure is also done at the level of the study field and it is very similar for each study program. RAT calculates the necessary number of students and income from student tuition fees to determine break even point. Study program has a stable number of students - around 20 - which calls for activities for more students to make this study program more profitable in the long term.

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

Conclusions:

The master study program is a study program with high degree of satisfaction from all stakeholders in terms of financial resources and necessary infrastructure and equipment.

Strengths:

1. Quality infrastructure in terms of building, lecture rooms, computer rooms, library and laboratories for staff and students;
2. A new laser centre with 15 different laser machines to conduct research and educational work.
3. Library provides staff and students with literature and services, e.g. scientific database, on a very high level;

No major weaknesses observed in regards of Resources and Provision of the Study Program.

## **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 program is a study program with high degree of satisfaction from all stakeholders in terms of financial resources and necessary infrastructure and equipment.

## **2.4. Teaching Staff**

### **Analysis**

2.4.1. The qualification obtained by the teaching staff involved in the implementation of the study program complies with the conditions for the implementation of the study program and the requirements of regulatory enactments. The evaluation of the submitted CVs revealed that the education obtained for all teachers is practically directly related to the specific field of science. Relevant research competence is ensured by the active scientific activity of the lecturers of the field both by conducting research in various projects and by participating in the exchange of experience in Erasmus programs. Some lecturers regularly improve their qualifications by taking various courses. Lecturers with extensive professional work experience in the field are also involved in the

implementation of the study program.

The English language skills of some teachers should be improved in additional courses, as this may affect the acquisition of industry-specific terms and features. But in general, most of the staff's existing English language skills may be sufficient for the implementation of the study program. Totally, 25 lecturers are involved in implementation of the study program Laser technologies and 14 of them have a doctoral degree.

2.4.2. During the reporting period, the total number of teaching staff members in the program has increased from 15 to 20, which was determined by attraction of foreign teaching staff, replacing the director of the program and attracting new lecturers. The last ones combine the duties of guest lecturers with the position of engineer at RAT and at the same time work in the professional sector of the industry in such way allowing to give students a vision from the point of view of manufacturing companies.

The academic staff of the program has significantly improved during the reporting period in the increased number of leading researchers from 1 (in 2015) to 10, as well as attracting two new researchers, what significantly increased the number of teaching staff members involved in science and scientific activity developing and engaging in projects. In such way 8 lecturers are elected to both pedagogical and scientific positions at the same time.

In general, the attraction of foreign visiting professors could provide new impetus to the study program, but at the same time the overload of guest lecturers working in the industry, working in several companies and also in RAT, is quite high, which, however, can have an impact on the quality of studies.

2.4.3. N/A

2.4.4. Most staff have publications in peer-reviewed journals, including international ones, over the past six years. The only exception is a couple of teachers who do not have publications, but they have a long experience in teaching a particular study course or have a practical experiences working in industry.

2.4.5. The evaluation of the mutual cooperation of the teaching staff is most clearly visible in the preparation and teaching of the study courses. It is a common practice in RAT, that there are several (2-4) lecturers who deliver the same study course, where topics of the study course are divided among the lecturers, and in such way each could deliver his own part, but may be replaced by colleagues if it would be necessary. Cooperation between them is also actively promoted by joint work in scientific projects and commissioned research, work on joint publications and participation in conferences, joint meetings of lecturers and last semester students on the development of qualification work. Cooperation can also be facilitated by the specifics of the RAT faculty, which the experts noted during the visit - lecturers' work (office) places are located in the same or adjacent rooms.

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

The qualification and research record of the teaching staff is in general on a satisfactory level. The mechanism of collaboration between the teaching staff, as also information flow between the director of the study program and the teaching staff is very good. The scientific activity in terms of publishing is good, but always could be increased. The attraction of foreign visiting professors could provide new impetus to the study program.

Strengths:

1. Foreign professors are involved in teaching.
2. Good communication between staff and study program director.
3. Lecturers representing industry are involved in the study process.

Weaknesses:

1. Staff overload is possible for teaching staff trying to combine work at a university and industry.
2. Scientific activity in terms of publishing and participation in projects in related field could be higher for some lecturers.

## 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

The qualification obtained by the teaching staff involved in the implementation of the study program complies with the conditions for the implementation of the study program and the requirements of regulatory enactments.

## 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 program complies with the provisions of the Cabinet of Ministers Regulation 13.05.2014. No. 240 "Regulations on the State Standard for the Academic Education"  
<https://likumi.lv/doc.php?id=266187> ( Compliance - Annex 4).

- 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

N/A

- 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 (Annex 7) comply with regulations in the Law of Higher Education Institutions and are provided both in English and Latvian, but the materials and literature should be updated.

- 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

The provided sample of the diploma (Annex1 ) complies with the procedure according to which state recognised documents of higher education are issued.

- 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

The academic staff of the academic study program complies with the requirements set forth in Section 55, Paragraph one, Clause 3 of the Law on Higher Education Institutions (Annex 2 and Annex 8)

- 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

According to Annex No 2 the Council for Higher Education on 22 February, 2015 had allowed to implement this study programme for less than 250 students.

- 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

N/A

- 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

The attached CVs and confirmation in Annex 12 verify that the state language proficiency complies with the rules of Cabinet of Ministers No. 733 (Regulations Regarding the Extent of the Knowledge of the Official Language, the Procedures for Examining the Proficiency in the Official Language and the State Fee for Examining the Proficiency in the Official 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:** Partially compliant

The attached confirmation in Annex 13 verifies that the English language proficiency of academic staff is at least B2 level. In some of the CVs it is noticeable that some of the academic staff have a lower English proficiency level in one or two sections (e.g. writing, speaking).

- 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

The attached sample of study agreement (Annex 8) complies with rules of the Cabinet of Ministers. Nr. 70. (Mandatory provisions to be included in the 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 attached document in Annex 6 confirms that an agreement with Ventspils augstskola is in place and students will be provided with opportunities to continue their education in VeA information technologies faculty.

- 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

The attached document in Annex 7 confirms that students are guaranteed compensation for losses if the study program is not accredited or the study program's license is revoked due to the actions (actions or omissions) of the RAT and the student does not wish to continue studies in another study program.

- 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

N/A

- 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

N/A

**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

The study program complies with the requirements set in national regulatory enactments, but in some CV's of the academic staff it is noticeable that some of the academic staff have a lower English proficiency level in one or two sections (e.g. writing, speaking) and the materials and literature should be updated.

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

The aims and outcomes of the study program are well defined in the documentation, as well as the outcomes for each separate study course. The professional qualification, degree and the content of

the study program is interrelated, and the students are provided with reasoning why such study courses are needed in the profession.

The study program demonstrated a strong social and economic need for it from the employers side, but the data provided in the graduate survey is not sufficient, there were only 3 respondents in 2019. - 2 of them working in the related sphere. The study program has a strong equipment base and a separate laser centre, where students can improve their practical knowledge. The study program has a good informative base provided by the library of RAT. The technical and informative base is regularly updated. The academic staff is encouraged to raise their qualification.

Strengths:

1. The study program complies with the study field
2. The study program is made in accordance with national regulations
3. The study courses and their content are revised every year
4. The study program has clearly defined aims and objectives of each study course
5. The study program has a strong technical base of equipment
6. The study program is provided with a strong informative base in the library of RAT
7. The teaching staff has a good qualification, as well improves their qualification during the year with courses and practice in the industry

Weaknesses:

8. The description of the study program is not available in the webpage of RAT
9. Used materials and the available literature should be updated because it has become outdated
10. The English language skills of some representatives of the academic staff, do not comply with level B2 or higher

## **Evaluation of the study programme "Laser Technologies"**

Evaluation of the study programme:

Good

## **2.6. Recommendations for the Study Programme "Laser Technologies"**

### **Short-term recommendations**

- |   |
|---|
| 1. It is necessary to supplement the list of compulsory literature with newer literature sources in study courses where this has not been done. It is also necessary to supplement the information in the description of study courses, where necessary, based on comments in the report. |
| 2. Director of the study program should control the workload of the teaching staff, the number of study courses to be taught, in order to avoid a decrease in the quality of teaching.  |
| 3. Reconsider the interconnection of economical and management subjects to the technical subjects, since some students do not see the aim of them.  |
| 4. Provide clear information about how students can access the laser centre outside of the lecture time, as well as safety regulations if they get injured outside of the lecture time.   |

### **Long-term recommendations**

5. Until accreditation, it is necessary to consider the provision of English to students who have less knowledge and need to acquire it.

6. Director of the study program should pay attention to the maximum involvement of all staff in various projects, trying to find the potential contribution of each employee.

7. Director of study program should ensure feedback with students working on the implementation of their recommendations for the improvement of study courses.

## II - "Laser Technologies" ASSESSMENT

### II - "Laser Technologies" ASSESSMENT

#### 2.1. Indicators Describing the Study Programme

##### Analysis

2.1.1. The study program Laser Technologies (51521) is a doctoral study programme. The programme complies fully with the corresponding study field both regarding its name as well as the content. The study program represents a logical follow up to the MSc in Laser Technology program taught by the RAT offering research focused theory and practice studying in addition to advanced set of knowledge, skills and competences in the field of laser and photonics engineering.

2.1.2. The name of study program corresponds to the code 51521 of the study program according to Latvian Education Classification (Latvian Cabinet of Ministers Regulations (Cab,Reg.) No. 322, <https://likumi.lv/ta/id/291524-noteikumi-par-latvijas-izglitiba-klasifikaciju>), meaning that first two digits `51` notes that the study program is Doctoral studies (doctoral degree) study program (level 8 of Latvian and European Qualification Framework) and the last three digits `521` notes the study program belongs to the program in "Mechanics and Metal Processing".

Consequently, the awarded degree "Doctor of Science (Ph.D.) in Mechanical Engineering and Mechanics" corresponds to the study program code and title.

The study program is held in Latvian and English language. The study program is offered in a full-time studies format of the period of 3 years and Part time extramural studies format of the period of 4 years in the amount of 120 Latvian study credit points or 180 ECTS.

##### 2.1.3. and 2.1.5

The given study program is a new study program realized as a joint program of the RAT and the Bulgarian "Angel Kanchev" University of Ruse. The duration of the program is three years and its expected outcomes focus on capacitating graduated doctors to demonstrate new understanding of the studied technology as well as to conduct targeted research on specific challenges of modern photonics engineering. The principal aim and the duration of the study program both seem appropriate. Given the nature of the study program, in addition to profound English literacy, the admission requirements mandate a master's degree in engineering, natural sciences or equivalent professional education which is deemed adequate.

2.1.4 Being a new study program, it is yet to demonstrate both its economic and social justification, as well as the adequacy of the admission requirements applied. The initial student interest is rather moderate and remains to be seen whether more substantial interest is likely to be generated. Nevertheless, the study program complies with the strategic science and research-driven orientation of the national economy, and as such should be supported fully especially in its beginnings.

As has been the case with other technology-focused program taught by the RAT , the given study program also generates a wide range of positive spin-off effects in the society. Many of them are directly related to the programs potential to attract highly educated foreign professionals to take part in Latvian research and economy, and hence contribute greatly to much valued knowledge and experience sharing. Nevertheless, it remains to be seen whether adequate financial benefits would complement such social benefiting.

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

Conclusions:

The given study program is a new study program realized jointly with a Bulgarian partner. As such it still remains to prove itself sound and fruitful both with respect to the financial gains it would provide the HEI with, as well as regarding its indirect effects on the local community.

Strengths:

1. Very competitive hi-tech discipline is likely to attract interest for commercialization-potent research

Weaknesses:

None

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

### **Analysis**

2.2.1. The structure of Doctoral study program Laser Technologies at RAT is regulated by the Regulations on Development of Study Course Programmes approved by the Study Council.

The program is implemented by RAT and “Angel Kanchev” University of Ruse and is fully in line with development strategy of RAT and future challenges. The content of the study program corresponds to the given specialty and is prepared in accordance with the development trends of the industry, labor market and science. The study courses are arranged sequentially by semesters (20 CP each).

In general, the descriptions of the most study courses are prepared in good quality and include all the necessary sections. The aim, content, acquired knowledge, skills and competencies of the study courses are in line with the main goals of the study program and the outcomes to be achieved. The evaluation methods mentioned in the description of study courses are logical and aimed at achieving results. In face-to-face interviews, students confirmed that the requirements for study courses when starting their studies are clear and understandable to them.

The content and all study courses within the study program have been developed in observance of the relevant trends in the field, both in Europe and worldwide. The study courses were developed on the basis of foreign doctoral study program assessment, in particular, the "Optics and Photonics" doctoral study program of Karlsruhe Institute of Technology (Germany), as well as the doctoral study program “Lasers, Photonics and Vision” developed jointly by the University of La Coruña, the University of Santiago de Compostela and the University of Vigo (Spain). Besides of that there was considered Salzburg recommendations for doctoral study programs and the Salzburg Recommendation Progress Report. In general, it shows the compliance of the content of the study program with the level of development of the latest technologies and related findings. This will allow doctoral students to be in line with the latest developments in the field. This is exacerbated by strong cooperation with Bulgaria and Germany universities, which have a strong and traditional study and research environment in laser technology, which is not so great in the case of RAT. Consequently, the updating of the study content is not in doubt.

Besides of that study course "Scientific Work" does not contain any information on learning outcomes and their assessment, course content, requirements for awarding credit points, etc. And only 6 out of 15 study courses contain requirements for acquiring existing courses. However, certain specialized courses require certain prior knowledge, especially in such a specific field.

The mapping of the learning outcomes of the study program shows that the planned learning outcomes of the study courses correlate with the learning outcomes of the study program and the topics in the study course program do not overlap. In overall, the defined outcomes of the study program and study courses correspond to the objectives of higher education, as also to the Latvian Qualifications Framework and the European Qualifications Framework.

Four courses are implemented by staff of "Angel Kanchev" University of Ruse, and one is implemented in collaboration with staff of RAT. The other courses are taught by staff of RAT. The study process is organized at a good level. Due to the small number of students, ERASMUS opportunities can now be used for mobility. As a large part of the doctoral students' study plan consists of scientific research, the amount of permanent work is appropriate.

2.2.2. The award of a degree is based on the achievements and knowledge of the relevant field of science. This is confirmed by the long-term scientific and teaching experience of the teaching staff of the study program , especially the cooperating university, in the given field, as well as the modern equipment and laboratories at the disposal of RAT. In addition, the topics of the doctoral theses offered are fully in line with the scientific activity of the above-mentioned lecturers. This is confirmed by the obtained patents, publications and participation in projects. At the moment RAT together with cooperation universities offers the following topics for doctoral students: Laser marking for passivation and corrosion resistance material for medical instruments, Laser radiation and laser safety, Analysis of surface laser treatment process parameters for antibacterial effect, etc. All the topics of the dissertation have a high scientific potential and provide for creation of new scientific findings that could further be used in the national economy.

RAT expect that the program will promote the development of research in the field of laser technologies, providing for cooperation between different study levels, especially with master's study program in the same specialty at RAT , as well as cooperation with other higher education institutions and scientific institutions.

2.2.3. The basic principles for the evaluation of the learning outcomes in RAT are based on European standards and guidelines (ENQUA) for quality assurance in the European Higher Education Area, which set out the main principles of the student-centred process, as also internal documents: Regulation of Examinations and Testing Session at RAT , Methodological recommendations for organizing students' independent work at RAT, Regulations on course examinations and tests, Outcome-Based Study Quality System of RAT, Plagiarism Control and Prevention Rules at RAT.

Form of realization of the study process are lectures, practical works and independent work of doctoral students. Considering the specifics of the doctoral program the laboratories of the RAT are freely available to doctoral students for independent work 7 days a week, which thus facilitates research in their spare time. In overall, the principles of student-centered education in the study program RAT provide by offering study content that is most able to ensure the achievement of the study results of the study program, flexible study paths, including observing the employment of students during studies, providing with full consultative support and full access to the study resources necessary to achieve the study results, including those available remotely. Interviews with doctoral students show that they are satisfied with this type of approach and did not indicate the need for any improvements. Besides of that study program includes also specific brief courses twice a semester - seminars implying discussions between the doctoral students of the study program, their supervisors and lecturers involved in the implementation of the program. In that case seminars will be planned remotely, for example, on ZOOM, Teams, Webex or other platforms. In the study

process, combined teaching methods also dominate, where solving real problems of the industry requires doctoral students' continuous activity and mutual communication in such way developing critical thinking.

The e-learning environment Moodle is also used to promote independent studies in the study process.

The above principles are implemented for all students, including students of a partner universities. In any case, currently the small number of students in the program allows to realize an individual approach if it is necessary.

2.2.4. N/A

2.2.5. The program provides for defence of doctoral theses in the institution implementing the program at the "Angel Kanchev" University of Ruse, but there has been signed an agreement on promotion with the Promotion Council in Physics and Astronomy of Daugavpils University. Also, an agreement has been signed with DU on the establishment of a joint promotion council, attracting RU staff.

2.2.6. Not applicable, as there are no graduates in the program.

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

In overall, the program is fully in line with development strategy of RAT and future challenges and the content of the study program corresponds to the given specialty and is prepared in accordance with the development trends of the industry, labor market and science. The mapping of the learning outcomes of the study program shows that the planned learning outcomes of the study courses correlate with the learning outcomes of the study program and the topics in the study course program do not overlap. The award of a degree is based on the achievements and knowledge of the relevant field of science, which is confirmed by the long-term scientific and teaching experience of the teaching staff of the study program , especially the cooperating university. The principles of student-centered education in the study program are achieved. The content of study courses and its implementation can be assessed as good. It meets industry requirements and scientific trends.

Strengths:

1. Current literature is used in the study courses together with the latest periodicals.
2. The study courses are complementary with the possibility to use acquired skills and competences in other courses. Besides of that, the planning is logical and sequential.
3. Access to laboratories of the RAT for independent work 7 days a week.

Weaknesses:

1. None.

### **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 content of the study program corresponds to the given specialty and is prepared in accordance with the development trends of the industry, labor market and science.

## 2.3. Resources and Provision of the Study Programme

### Analysis

#### 2.3.1.

The infrastructure of the RAT was described in the assessment of the study field and the description applies for the study program as well. We must emphasize the latest infrastructure and equipment acquisition - laser centre - that provides researchers, academic staff and students with state-of-the-art conditions to engage into research and educational work. This centre includes 15 different lasers, such as lasers for hardening and welding, solid-state lasers, fibre-optics lasers, CO2 lasers etc.

#### 2.3.2.

Since this study program is joint study program it includes also a partner from Bulgaria: Faculty of Mechanical Engineering and Manufacturing of the "Angel Kanchev" University of Ruse. They develop complementary laser technologies and some additional technologies, such as cutting, engraving, vacuum technologies and possess advanced mechanical testing equipment. At the moment both institutions do not cooperate on any funded joint research project.

#### 2.3.3.

Responsible persons for this study program are satisfied with financial resources for the study program and infrastructure and equipment to implement study program. The study provision, scientific support, informative provision, material and technical provision, and financial provision comply with the specific features and the conditions for the implementation of the study program.

Besides scientific cooperation with official doctoral study program partner University of Ruse, RAT cooperates in scientific area with other Latvian R&D institutions. They have a strong cooperation with DU, as well as some researches with RTU, in December 2021 they signed an agreement with LU in the direction of medical purposes, nanoparticles in medicine. This cooperation between 4 institutions is meant to further deepen scientific work in the field of laser technologies and complement each other with technologies and scientific areas that RAT does not develop, such as research of materials.

The cost of one student is sum of direct costs and indirect costs: 8314 EUR/year. The financial structure is also done at the level of the study field and it is very similar for each study program. RAT calculates the necessary number of students and income from student tuition fees to determine break even point. Study program has enrolled first generation of students in 2021 - currently there are 3 doctoral students.

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

#### Conclusions:

The joint doctoral study program is a study program with high degree of satisfaction from all stakeholders in terms of financial resources and necessary infrastructure and equipment.

#### Strengths:

1. Quality infrastructure in terms of building, lecture rooms, computer rooms, library and laboratories for staff and students;
2. A new laser centre with 15 different laser machines to conduct research and educational work.
3. Library provides staff and students with literature and services, e.g. scientific database, on a very high level;
4. extended scientific cooperation network with Latvian universities in the field of laser technologies.

Weaknesses:

1. No official joint scientific research projects between RAT and University of Ruse at the moment;
2. The number of published papers in top Q1 and Q2 scientific journals of academic staff is quite low for researchers at the doctoral study program level.

## 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 joint doctoral study program is a study program with high degree of satisfaction from all stakeholders in terms of financial resources and necessary infrastructure and equipment.

## 2.4. Teaching Staff

### Analysis

2.4.1. The qualification of the teaching staff fully complies with the requirements of the laws and regulations and ensures the achievement of the learning outcomes of the study program. The evaluation of the submitted CVs revealed that the education obtained for all teachers is practically directly related to the specific field of science. The teaching staff involved in the study program has all the necessary competencies and skills to work with doctoral students, including the supervision of doctoral theses. All staff have doctoral degree and some of them also significant academic experience in foreign universities, including regular updating of academic competencies through ERASMUS + mobility. There are also positive examples of professional development of academic staff in foreign universities as well. Total number of staff - 12.

In order to strengthen the laser technology, including the doctoral study program, RAT participates in various projects that includes internships in the institutions of cooperation partners, use and development of joint infrastructure resources, etc. RAT states that it is planned to attract also guest lecturers as well. In general, all the above indicates a positive attitude in promoting the development of the study program.

2.4.2. The program will start its operation in the autumn semester of 2021, there have been no changes in the teaching staff after licensing.

2.4.3. The total number of publications in the SCOPUS database of the teaching staff involved in the implementation of the study program is applicable to implement research and scientific activities in the given field. In recent years it is visible is an increase in the total number and quality of publications. It is desirable to increase the number of publications in Q1 and Q2 quartile journals. The involvement of staff in the projects is visible, but it is very different - some teachers have a lot of participation in projects, while others have very little or no participation. In some cases, the last participation in projects is 5 years ago. Particular attention should be paid to the involvement of foreign staff in research projects.

2.4.4. Each member of the academic staff has published publications in peer-reviewed journals and/or conference proceedings.

2.4.5. The evaluation of the mutual cooperation of the teaching staff is most clearly visible in the preparation and teaching of the study courses. It is a common practice in RAT, that there are several

lecturers who deliver the same study course, where topics of the study course are divided among the lecturers. Besides of that RAT states that there is planned inter-institutional cooperation of the teaching staff, coordinated by the Study Programme Council, the cooperation of the teaching staff in joint researches and project development. There are no visible obstacles to staff co-operation within the RAT, but an effective model of co-operation with RUs, given the relatively large distance between universities, could be a challenge.

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

The qualification and research record of the teaching staff is in general on a satisfactory level. The mechanism of collaboration between the teaching staff, as also information flow between the director of the study program and the teaching staff is very good. The scientific activity in terms of publishing is good, but always could be increased. It is desirable to increase the number of publications in Q1 and Q2 quartile journals.

Strengths:

1. Good communication between staff and study program director.
2. Appropriate qualification of the staff in such a narrow research direction in the regional university.
3. Plan to attract guest lecturers and researchers.

Weaknesses:

1. Necessity to increase the number of publications in Q1 and Q2 quartile journals.
2. Necessity to promote the involvement of all staff in projects.

### **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

The qualification of the teaching staff fully complies with the requirements of the laws and regulations and ensures the achievement of the learning outcomes of the study program.

### **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

N/A

- 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

N/A

- 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

Attached study course descriptions (Annex 6) complies with regulations set forth in Law of Higher Education Institutions and are provided both in Latvian and 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

The provided sample of the diploma (Annex 1) complies with the procedure according to which state recognised documents of higher education are issued. According to Annex 2 the joint diploma is issued by RTA. The title of the degree to be awarded will differ in the RU 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

The staff of the study programme complies with the requirements set forth in Section 55, Paragraph one, Clause 3 of the Law on Higher Education Institutions (Annex 8).

- 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

N/A

- 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

The teaching staff has more than five teaching staff members with a doctoral degree and at least three of which are experts approved by the Latvian Science Council.

- 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

The attached CVs and confirmation in Annex 12 verify that the state language proficiency complies with the rules of Cabinet of Ministers No. 733 (Regulations Regarding the Extent of the Knowledge of the Official Language, the Procedures for Examining the Proficiency in the Official Language and the State Fee for Examining the Proficiency in the Official 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

The attached confirmation in Annex 13 verifies that the English language proficiency of academic staff is at least B2 level.

- 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

The attached sample of study agreement (Annex 8) complies with rules of the Cabinet of Ministers. Nr. 70 (Mandatory provisions to be included in the 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 attached document in Annex 6 confirms that an agreement with Daugavpils university is in place and students will be provided with opportunities to continue their education in DU study programme "Solid state physics".

- 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

The attached document in Annex 7 confirms that students are guaranteed compensation for losses if the study program is not accredited or the study programs license is revoked due to the actions (actions or omissions) of the RAT, and the student does not wish to continue studies in another study program.

- 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

The Annex 2 and the attached bilateral agreement between RAT and "Angel Kanchev" university of Ruse confirms that the program complies with requirements in the Law on Higher Education Institutions.

- 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

N/A

### **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 study programme complies with the requirements set in national regulatory enactments.

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

The program is relatively new and has attracted students only recently, so it is hard to evaluate the overall quality of the study program . Overall the study program has clearly defined aims and outcomes in the documentation. The professional qualification, degree and the content of the study program is interrelated, and the students are provided with reasoning why such study courses are needed in the profession. There are some problems about how the information reaches international students, according to the interviews with the students.

Experts consider that based on economical and social justification indicators don't find it particularly justified to kick-off a PhD study in an environment where all the stakeholders are very much focused on quick wins. That has been directly obtained from the undertaken interviews. Students are in a situation, where they have to balance between the level of the study taken and the gains they are likely to enjoy upon graduation. Employers on the other hand are interested to get their staff as highly educated as possible, but would not be interested to finance their education. Based on that it is hard to expect that any major interest would be generated for a PhD study in the future. It is also can be seen from the interest that has been generated so far and the corresponding number of students enrolled. Besides of that this is also confirmed by feedback from the foreign PhD student, who has been very much concerned that he's not getting the quality of the knowledge/skills he had thought a PhD programme of that kind would provide him with.

#### Strengths:

1. The study program complies with the study field
2. The study program is made in accordance with national regulations
3. The study program has a strong technical base of equipment
4. The teaching staff has a good qualification, as well improves their qualification during the year with courses and practice in the industry

#### Weaknesses:

1. Low count of high level publications from the side of academic staff.
2. Low count of students and no clear strategy how to attract more students to the study programme.
3. There are some problems regarding how international students get information regarding the study programme.

### **Evaluation of the study programme "Laser Technologies"**

Evaluation of the study programme:

Good

### **2.6. Recommendations for the Study Programme "Laser Technologies"**

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

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

1. Recommended that RAT together with director of study program closely monitors the realization of the study program and evaluates its efficiency and successfulness against a set of clearly defined milestones.

2. Director of the study program should pay attention to the maximum involvement of all staff in various projects, trying to find the potential contribution of each employee.

3. RAT management and program directors should regularly monitor the number and quality of teaching staff's publications. Appropriate mechanisms should be put in place to encourage an increase in the number of publications in cited and high-impact journals when conventional incentive mechanisms do not work.

### 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:		Partially compliant	RAT has established a quality management system and quality policy, therefore providing continuous development and improvements in the study field. RAT has a clearly defined system to gather complaints and recommendations regarding the study field, but unfortunately there is lack of proof regarding how recommendations and complaints of students are implemented in the study process.
R2 - Compliance of scientific research and artistic creation with the level of development of scientific research and artistic creation (if applicable)	Fully compliant		RAT has at its disposal appropriate equipment and staff for the successful development of the given research directions.

Requirements	Requirement Evaluation		Comment
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		RAT's cooperation with industry partners is one of the most important strongholds of HEI's operations. Such an operating practice makes the study programs taught and their outputs industry relevant, timely and commercialization-potent.
R4 - Elimination of deficiencies and shortcomings identified in the previous assessment of the study field, if any, or implementation of the recommendations provided.		Partially compliant	The implementation process of recommendations is provided, but some of the recommendations have been implemented only partially.

#### 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	Mechanical Engineering (41521)	Not relevant	Fully compliant	Fully compliant	Partially compliant	Good
2	Mechatronics (42521)	Not relevant	Fully compliant	Fully compliant	Partially compliant	Good
3	Laser Technologies (45521)	Fully compliant	Fully compliant	Fully compliant	Partially compliant	Good
4	Laser Technologies (51521)	Fully compliant	Fully compliant	Fully compliant	Fully compliant	Good

#### The Dissenting Opinions of the Experts

Experts do not have different opinions.