JOINT REPORT BY THE EXPERTS ON THE INCLUSION OF A LICENSED STUDY PROGRAMME ON THE ACCREDITATION FORM

**Riga Technical University**

STUDY FIELD

**Power Industry, Electrical Engineering, and Electrical Technologies**

STUDY PROGRAMME

**Professional bachelor study programme "Smart Power Systems"**

Experts:

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# I. Summary of the Assessment

Concise summary of the assessment of the study programme to be included on the accreditation form and its compliance with the requirements set forth, as carried out by the experts. Specify the positive and negative aspects identified.

***Summary***

*The experts have thoroughly reviewed the documents provided by RTU, engaged with various groups, and inspected the facilities. The study program appears to be highly relevant, and the teaching staff is exceptional. Students and employers alike appreciate the quality of the facilities and laboratories. However, there is a need to focus on developing labs for recent and future technologies, and this should be discussed further with employers.*

*Both employers and students have expressed a desire for more practical assignments in the program. It also seems that students lack sufficient knowledge about the opportunities to participate in scientific projects and the specifics of the final thesis. Improving outgoing mobility would further enhance the skills of staff and students. Additionally, decisions need to be made regarding how to enhance admission to the English version of the program and its future.*

*Students have acknowledged that the subjects in the program are well connected, which contributes to a cohesive learning experience. The program director's practice of conducting private meetings with staff and students is beneficial for fostering mutual understanding and proactive problem-solving. Furthermore, considering a motivation package for staff who achieve excellent results could be advantageous.*

*In conclusion, the experts find that most of the recommendations from the previous evaluation have been satisfactorily implemented.*

***Positive aspects of the program provision can be listed:***

*1)During the program's development, local industry experts actively participated and contributed their insights.*

*2) Lectures have been delivered in both Latvian and English, creating an opportunity to attract a larger number of foreign students.*

*3) There is a large proportion of young academic staff (70% are under fifty years of age).*

*4) Academic staff has high qualifications which ensures theoretical and research potential - 80% have the degree of Doctor of Engineering or a different doctoral degree (PhD).*

*5) Most staff members involved in teaching possess a strong professional industrial background, which enhances the transfer of practical knowledge to the students enrolled in the professional bachelor programme.*

*6) The study process involves guest lecturers - specialists from the industry and enterprises who, within corresponding study courses, provide specific knowledge and share their experience.*

***Risks identified:***

*1) Amount of studies is not calculated to the latest regulatory documents: Cabinet of Ministers Regulation - Cabinet Regulation No. 305 "Regulations on the state standard of professional higher education". ECTS should be used instead of Latvian Credit Points.*

*2) Maintaining the English version of the program should be subject to further discussion among RTU and its stakeholders, due to a lack of students.*

*3) In order to further strengthen relationships with professionals from other higher education institutions and provide students with opportunities to explore new careers in academia and research, both incoming and outgoing mobility must be enhanced.*

*4) Short-term recommendations regarding description of study courses are marked as completed or started to be implemented, however formal requirements regarding bibliography items in English for courses EEE202, DMF101, DIM205 are still not met.*

# II. Description of the study programme

## 1. Indicators describing the Study Programme

| | | |
|---|---|---|
| 1. | Name of the higher education institution/college | Riga Technical University |
| 2. | Name of the study field corresponding to the study programme | Power Industry, Electrical Engineering, and Electrical Technologies |
| 3. | Name of the study programme | Smart Power Systems |
| 4. | Code of the study programme in accordance with the Latvian Education Classification | 42522 |
| 5. | Language of study programme implementation | Latvian and English |
| 6. | Amount, duration, form and type of the study programme (also distance-learning) | Full time studies form: 4 years<br>Part time extramural studies form: 5 years |
| 7. | Admission requirements | Secondary education |
| 8. | Address of the study programme implementation, indicating whether the study programme is implemented in the **branches** of the higher education institution / college | Ķīpsalas street 6A, Riga |
| 9. | Degree, professional qualification or degree and professional qualification to be awarded | Professional bachelor degree in energy and electrical engineering and electrical engineer professional qualification |
| 10. | Date of study programme licensing | 30.06.2021 |
| 11. | Date of starting the implementation of the study programme | 01.09.2021. |

| | | |
|---|---|---|
| 12. | Accreditation term of the study field | 15.09.2028. |

## Analysis

### *1.1. Compliance of the study programme with the study field*

The programme under evaluation is to be included in the RTU study field "Power Industry, Electrical Engineering, and Electrical Technologies". Energy and energy efficiency represent one of the most important aspects that determine the competitiveness of Latvian companies and economic growth. Thus, changes are conducted in order to adapt to the development of technologies and to react to changes in the qualification framework of the Energy sector. In this context, the professional bachelor study programme "Smart Power Systems" (further in the text — the Study programme), which has been implemented since study year 2021/22 together with other study programmes of the study field, fully complies with the strategy of RTU Faculty of Electrical and Environmental Engineering (further in the text – FEEE), which is directed towards an internationally known study, research and innovation institution in the sectors of energy, electrical and environmental engineering, ensuring a high-standard study process, internationally recognised scientific research and sustainable innovations, commercialisation and transfer of knowledge in national economy. Overall, this strategy promotes the modernisation of the national economy of the Republic of Latvia, which is directed towards the implementation of innovative solutions in various sectors, which is unthinkable without the participation and contribution of well-prepared electric power engineers.

The Study programme offers bachelor-level education in the Electric Power Engineering, Power Supply, and Electric Machinery and Equipment sub-fields of the Electric Engineering, Electronics, Information and Communication Technology field, and the students can obtain the professional qualification of electric engineer.

The knowledge and skills mastered during the studies enable the students of the study field to develop equipment and systems required in the generation, transmission and distribution of electric power, automation and stepping up of the energy efficiency of the manufacturing, transport, service and household sectors, already during the writing of their graduation papers.

The study field also includes Masters and Doctoral programmes of the same name.

### *1.2. Compliance between the title of the study programme, the degree to be awarded*

In experts opinion the programme under evaluation fully complies with the Latvian Cabinet of Ministers Regulation 512. "Regulations on the State Standard for Second-Level Professional Higher Education" and professional occupational standard "Electric Engineer" (date of approval - 11.08.2021, code 2151 01). The compliance is justified by supplements to the report No. 3.6 "Compliance with the State Education Standard" and 3.7 "Compliance with the Professional Standard".

It is to be noted that there is a new version of the Cabinet of Ministers Regulation - Cabinet Regulation No. 305 "Regulations on the state standard of professional higher education" defining use of ECTS instead of Latvian Credit Points to measure volume of studies. Experts recommend improving the programme, study plan and course descriptions in order to comply with the new version of regulations until 31st December of the year 2024 (Law on Higher Education Institutions).

Title of profession to be awarded is "Electric Engineer" (https://registri.visc.gov.lv/profizglitiba/dokumenti/standarti/2017/PS-167.pdf), but title of the study programme is "Smart Power Systems". Usually "Power engineering" (generation, transmission and

distribution of electric power) is understood as a subfield of "Electrical engineering" (study, use, maintain any equipment/device using electrical energy). The content of the study programme more complies with the broader term "Electrical engineering". This terminological difference may be misleading for some english-speaking students, therefore experts suggest taking it into account when working on foreign student attraction. There is no such problem for title in Latvian.

*1.3. Compliance of the study programme indicators (study programme code, amount, implementation duration) with the learning outcomes defined for it.*

According to the initial Report chapter 2.1.4 the main learning outcomes defined are to provide in-depth knowledge in electric power engineering and electrical engineering and ensure skills in the fundamentals of scientific research work during all activities of study process. Also development of research skills and preparation for further studies at the master level are pointed out as learning outcomes.

Amount of the programme is 160 CP and besides field-specific and mandatory humanities and social science courses it includes general courses of innovations and entrepreneurship (SDD700) and research in speciality (EES731). Duration of the studies conforms to volume in CP and is 4 years for full-time studies and 5 years for part-time studies initial Report chapter 2.1.1.

The code of the study programme complies with the Cabinet regulations on the Latvian Education Classification, more detailed analysis is given in Row 3 in the analysis table for Requirement [R4] in this document.

***Conclusions*:**

*In experts opinion the content of the study programme ensures the achievement of the defined goals, tasks and outcomes.*

*The programme well integrates in the RTU study field "Power Industry, Electrical Engineering, and Electrical Technologies" completing the topic "Smart Power Systems" at all levels of higher education and is compliant with the Latvian Cabinet of Ministers Regulation 512. "Regulations on the State Standard for Second-Level Professional Higher Education" and professional occupational standard "Electrical Engineer".*

*The code (42522) of the study programme corresponds to Cabinet Regulation No. 322. (13.06.2017) on the Latvian Education Classification.*

***Strengths:***

*None*

***Weaknesses:***

*1) Amount of studies is not calculated to the latest regulatory documents: Cabinet of Ministers Regulation - Cabinet Regulation No. 305 "Regulations on the state standard of professional higher education". ECTS should be used instead of Latvian Credit Points.*

## 2. Topicality of the study programme

**Analysis**

*2.1. The topicality of the study programme and the compliance of the content with the tendencies of the industry (area), the changes made since the licensing of the study programme*

The Study programme is designed for current or potential employees of electric power and electrical engineering enterprises who seek to acquire or enhance theoretical knowledge and research skills in the field of power engineering. It aims to meet the demands of the Latvian and foreign employment markets in electric power systems and networks, as well as the needs of power utilities for qualified specialists. The development and validation of the Study programme involve various activities, including industry involvement, as explained by programme director during site visit interviews. In experts opinion, this helps to achieve optimal results such as producing competitive graduates who possess the necessary competencies and adaptability to address industry challenges and emerging trends.

The main goals and tasks of the Study programme focus on preparing young professionals not only to process vast amounts of information but also to approach industry development creatively and solve problems effectively. This approach makes graduates highly competitive in the industry and well-prepared for rapidly evolving scientific directions. The study course descriptions are closely aligned with the overall study programme goals, ensuring that the courses complement each other and lead to the desired outcomes upon program completion as stated by RTU in SAR. The excellent interconnectivity of the courses was also mentioned by the students of the programme during the site visit interviews.

The study process concludes with an internship and the completion and defence of a bachelor's thesis, which must adhere to relevant regulations, set by RTU, according to SAR. These academic components allow students to apply their knowledge and findings during the internship and in their future careers, both in Latvian and foreign enterprises. The internship proves mutually beneficial for the newly trained specialists and the participating enterprises.

Enterprises' willingness to provide practical training opportunities is evident through existing cooperation agreements with several companies, including JSC "Augstsprieguma Tikls" (High Voltage Network) and JSC "Latvenergo." Additionally, a cooperation agreement with the Latvian Association of Power Engineers and Energy Constructors (LEEA) facilitates finding placements for students during their study process, considering the possibilities offered by association members, according to SAR.

During the program's development, experts from the local industry were actively involved in various capacities, such as serving as staff members responsible for teaching in the program, as explained by the programme director during site visit interviews. According to the SAR and information gathered during site visit interviews, the experts find that the program's defined goals are directly relevant to the current needs of the industry, thereby enabling graduates to seamlessly enter the power enterprises business.

*The lectures are offered in both Latvian and English, allowing for the potential to attract a larger student number. However, currently, only a few foreign students have participated in the program as exchange students, as reported in SAR and by the programme director. Moreover, according to experience of the staff, delivered on the site visit interviews, these foreign students often possess different foundational knowledge compared to local students, leading to challenges in their smooth integration into the studies.*

The study program includes lectures, practical classes, laboratory work, and internships, offering comprehensive knowledge in electric power engineering and electrical engineering. It also equips students

with research skills, preparing them to become highly skilled specialists. The curriculum comprises both mandatory and elective courses, giving students flexibility in their learning path, as explained by the programme director and depicted in SAR and its annexes.

As per the interviews conducted during the site visit, the students appreciate the strong connection between subjects within the program. They find the labs to be adequate for acquiring the essential skills and knowledge required in the current job market. However, employers emphasise the need for further development of recent and future technologies in the labs to ensure that students acquire the skills and knowledge necessary for the evolving market demands in the future. Additionally, both mentioned groups suggested that the program would be enhanced by incorporating more practical tasks and hands-on approach for the students throughout their studies.

The experts suggest holding discussions with employer representatives to address the requirement for advancing the development of recent and future technologies in the laboratories, as it would ensure that students acquire the essential skills and knowledge needed to meet the evolving market demands in the future.

The experts propose initiating discussions with student and employer representatives to explore the possibilities and requirements of integrating more practical tasks and hands-on approaches for the students throughout their studies.

In addition to the changes made in accordance to previous expert group recommendations, analysed in chapter "4. Implementation of the recommendations received during the licensing of the study programme" of this report", there have been minor changes in the programme since the licensing according to SAR. The volume of part A1 “General Education Study Courses” has been changed from 12 CP to 14 CP, replacing study course SDD701 (4 CP) to course SDD700 (6 CP). The volume of part A2 “Field-Specific Theoretical Basic and IT Study Courses” has been changed from 37 CP to 39 CP, adding course DMS212 (2 CP) to the curriculum. Part A3 “Field-Specific Professional Study Courses” has been decreased from 51 CP to 49 CP though the removal of course EES727 (2 CP). In part B1 “Field-Specific Study Courses”, course DMS212 has been replaced by course EES727, resulting in no changes of volume. In part B6 “Languages” courses VIL169 and HVD216 have been removed and course HVD216 has been included to the curriculum. RTU states in SAR that the changes were mostly made for the purpose of fully ensuring the compliance of the study programme with the requirements of state education and the occupational standard.

### *2.2. Dynamics of the student number and prospects of employment for graduates.*

According to SAR, the number of students in the Study programme is relatively small, which can be attributed to several factors. Firstly, the program is in its early stages of implementation, and secondly, economic challenges such as the COVID-19 pandemic and the energy crisis have played a role. Additionally, the overall unfavourable demographic situation in the country has impacted student enrollment. Negative publicity surrounding the old study programs in the power and electrical engineering field has also contributed to a lack of competitiveness and dissuaded some secondary school graduates from pursuing this direction, as supposed by RTU itself in SAR.

However, despite these challenges, there is a positive trend, especially among those already employed in the industry. According to student number related tables in SAR, part-time extramural studies have seen a significant increase in enrollment (from 6 to 30 students in 1 year), while the number of students in the daytime department has remained relatively stable (68 vs. 63 students in 1 year). As the Study programme

has been in place since the academic year 2021/2022 and requires 4-5 years of studies, it is still too early to analyse the trends in the number of graduates.

The dropout rate has shown a decreasing trend during the overview period. Common reasons for dropout include underachievement, lack of funding, changing residence (often moving abroad), and opting for a different occupation. Notably, there have been no cases of students failing to renew their enrolment after taking a study break (academic leave). Some students have chosen to pursue studies in other institutions, resulting in their unenrollment from the current program, as reported in SAR.

As for foreign students, RTU has expressed interest from Ukraine and the Asian region in the Study programme. However, the mobility of Ukrainian high school graduates is limited due to the ongoing war, while economic crises have hindered the involvement of students from Asia. According to SAR, it is hoped that with time, as the Study programme gains more recognition globally and economic conditions improve in the target regions, there will be a greater influx of foreign students, potentially positively impacting the overall number of students in the program. During the site visit interviews, the programme director pointed out certain interests in enrollment to the programme from Uzbekistan.

During the time the program has been available, there has been a notably low number of foreign students enrolling in the studies as exchange students (by tables provided in SAR - 1 student, by tables shown by the programme director on the site visit - adding currently 2 students), and none have enrolled as regular stationary students at RTU, as reported in SAR. In experts opinion, this raises questions about the necessity of maintaining the English version of the program, and it should be subject to further discussion among RTU and its stakeholders.

The experts suggest that RTU engage in active discussions concerning the future of the program's English versions. This could involve either consolidating the English versions with other similar programs or considering the possibility of closing them and potentially opening a new and more attractive program. The current version faces apparent challenges in attracting student enrollments, and exploring these options may lead to better outcomes.

During interviews with employers, experts learned that the majority of regulations, requirements, and documentation in the industry are in Latvian language. For foreign students without sufficient knowledge of Latvian, this language barrier can pose challenges and potentially hinder the smooth and safe completion of their professional internships.

***Conclusions:***

*The study programme was developed and implemented in strong collaboration with industry representatives. The experts find that the program's defined goals are directly relevant to the current needs of the industry, thereby enabling graduates to seamlessly enter the power enterprises business. In addition to the changes made in accordance to previous expert group recommendations, there have been minor changes in the programme since the licensing, made for the purpose of fully ensuring the compliance of the study programme with the requirements of state education and the occupational standard.*

*The number of students in the Study programme is relatively small, which can be attributed to several factors. Yet, there is a positive trend, especially among those already employed in the industry, especially concerning the part-time extramural studies, where a significant increase in enrollment has been observed.*

*However, the future of studies in English language within the programme needs to be further discussed with RTU and its stakeholders, due to the lack of students opting for the English version of the programme.*

***Strengths:***

*1) During the program's development, local industry experts actively participated and contributed their insights.*

*2) Lectures have been delivered in both Latvian and English, creating an opportunity to attract a larger number of foreign students.*

***Weaknesses:***

*1) Maintaining the English version of the program should be subject to further discussion among RTU and its stakeholders, due to a lack of students.*

## 3. Resources and provision

**Requirement [R1]:** Compliance of the study base, science base (if applicable), information base (including library), material and technical base and financial base with the conditions for the implementation of the study programme and for ensuring the achievement of learning outcomes.

**Analysis**

*RTU has various departments responsible for different aspects such as material procurement, technical support, methodological guidance, and information provision. Examples of these departments include the Student Accommodation department, Infrastructure department, and Student Service department. The IT department offers multiple IT services to the university, as reported by SAR.*

*In experts opinion, RTU buildings are equipped with state-of-the-art technical support and control systems, ensuring modern, reliable, and secure IT infrastructure that provides high-quality IT services. The university's centralised system serves as a digital gateway, combining information from all RTU information system components. Different IT systems serve various purposes, such as the Centralised Study Management System for efficient administration of the study process, the Moodle e-learning system where academic staff members share electronic materials, assessment tests, and homework assignments, and the ORTUS internal system that provides necessary information to all students, as demonstrated partially during the site visit and reposted in SAR.*

*SAR states that since 2007, the e-learning environment of RTU has generated over 130,000 unique study course sites, providing students with access to electronic learning resources anytime and anywhere. The university's well-supplied library is available 24/7, serving as an essential resource for students. RTU boasts fast optical internet and an extensive wireless network infrastructure with over 400 access points. In experts opinion, the information resources to implement the study programme in Latvian and in English is sufficient.*

*Additionally, according to SAR, RTU has established specialised laboratories with dedicated infrastructure and equipment for specific program needs. These laboratories, such as the Protection Relay and Automation Laboratory, the Laboratory of Electric Power Supply Systems, and others, contribute to the university's cooperation with main Latvian power branch enterprises to find practical solutions for industry tasks. The laboratories were presented to the experts during the visit and in experts opinion, the laboratories are well equipped for the program needs and for gaining sufficient practical knowledge.*

*As depicted in SAR, RTU's financing from the state general budget is determined based on the list of study programs and the number of students. This funding covers utility payments, taxes, infrastructure maintenance, purchase of inventory and equipment, staff salaries, and support for scientific activities. In experts opinion and according to site visit interviews with the programme director, the funding is sufficient for studies in Latvian language versions of the programme, yet due to lack of students in the English versions, the funding seems to be insufficient. Experts feel that in order to minimise financial risks on the programme, the minimum number of students under which the programme would not be opened for studies should be set by RTU.*

*According to SAR, there are also tuition fee places available for joining the programme. These fees depend on the citizenship of the student and the size of the yearly tuition is unchangeable over the whole study period until the exmatriculation.*

***Conclusions:***

*RTU buildings are equipped with state-of-the-art technical support and control systems, ensuring modern, reliable, and secure IT infrastructure that provides high-quality IT services. The university's well-supplied library is available 24/7, serving as an essential resource for students. RTU has established specialised laboratories with dedicated infrastructure and equipment for specific program needs. Financing from the state general budget is determined based on the list of study programs and the number of students, additionally tuition fee places are available. In experts opinion and according to site visit interviews with the programme director, the funding is sufficient for studies in Latvian language versions of the programme, yet due to lack of students in the English versions, the funding seems to be insufficient.*

***Strengths:***

*None*

***Weaknesses:***

*None*

**Evaluation of the requirement [R1]:**

| Requirement | Compliance | | | Justification |
|---|---|---|---|---|
| Compliance of the study provision, science provision (if applicable), information provision (including | Fully compliant | Partially compliant | Non-compliant | *Implementation of the study programme and* |
| | x | | | |

| | | | | |
|---|---|---|---|---|
| library), material and technical provision and financial provision with the conditions for the implementation of the study programme and for ensuring the achievement of learning outcomes. | | | | *ensuring the achievement of learning outcomes is financially supported by state budget as well as Student tuition fees.*<br><br>*RTU has established specialised laboratories with dedicated infrastructure and equipment for specific program needs, buildings are equipped with state-of-the-art technical support, beneficial for all parties such as students and staff.*<br><br>*Library services and digital study material infrastructure is available 24/7.* |

**Requirement [R2]:** 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 of the laws and regulations.

**Analysis**

*The implementation of the study programme at RTU is carried out by highly qualified academic staff from various structural units. These professors and teachers hold doctoral degrees and are experts in their respective fields, for example A. Podgornovs (Electrical Machines) and J. Zakis (Semiconductor Converters in Power Engineering). Guest lecturers, who are specialists from relevant industries and enterprises, also contribute their specific knowledge and practical experience within corresponding study courses, as commented during site visit interviews by the industry representatives and programme director.*

*The qualifications of the academic staff align with the desired outcomes of the Study Programme and the goals of the Faculty of Electrical and Electronics Engineering (FEEE). According to SAR, the teaching*

*staff continuously improve their qualifications, methodological approaches, and scientific materials authored by them. From the interviews, conducted during the site visit, it was found that most of the teaching staff have a professional industrial background.*

*According to SAR, the academic staff involved in the study programme have shown a commitment to expanding their research interests and professional capabilities. From table 4 of the SAR, it can be seen that there has been a slight increase in the share of associate professors compared to the previous year (from 11 to 13), similarly to the total number of elected teaching staff (from 60 to 65). However, there have also been minor changes due to factors like retirement, completion of PhD studies, and the appointment of new ordinary teaching staff, states the SAR.*

*According to SAR, the programme benefits from a considerable proportion of young academic staff (70% under the age of 50) possessing qualifications that ensure the necessary theoretical and research potential (80% have an engineering degree of Dr.Sc.Ing. or PhD).*

*The teaching staff regularly undergo further training to improve their skills, teaching materials, and scientific output. The university emphasises the development and enhancement of teaching materials and scientific results through projects like the "Strengthening the Academic Staff of Riga Technical University in Fields of Strategic Specialisation" supported by the European Social Fund, as presented in SAR.*

*The experts propose considering a motivation package for staff who achieve excellent results, as this will provide further incentives for outstanding teaching performance, subject development, laboratory enhancements, and material improvements, while also encouraging staff's professional growth.*

*In typical RTU study programs, knowledge exchange and experience sharing occur both at the local and international levels, facilitated largely by the ERASMUS+ mobility program. This mobility fosters close relationships with professionals from other higher education institutions and allows students to explore new career opportunities in academia and research. However, due to Covid-19 travel restrictions during the reporting period, no teaching staff or students were able to utilise this opportunity in the last two years, as stated in SAR and repeatedly said during site visit interviews.*

*The experts suggest exploring ways to improve both incoming and outgoing mobility, as this will fortify ties with professionals from other higher education institutions and offer students the chance to explore new careers in academia and research. As required by the Law on Higher Education Institutions all academic staff have Latvian proficiency level at least C1, have Latvian as native language or have completed higher education studies in Latvian (see details in [R4], pos. 5).*

***Conclusions:***

*The implementation of the study programme at RTU is carried out by highly qualified academic staff from various structural units. The qualifications of the academic staff align with the desired outcomes of the Study Programme and the goals of the Faculty of Electrical and Electronics Engineering (FEEE). The programme benefits from a considerable proportion of young academic staff (70% under the age of 50) possessing qualifications that ensure the necessary theoretical and research potential (80% have an engineering degree of Dr.Sc.Ing. or PhD). Guest lecturers, who are specialists from relevant industries and enterprises, also contribute their specific knowledge and practical experience within corresponding study courses. However enhancing mobility within staff and students would further improve the programme through established professional contacts. Academic staff are compliant with the Law on Higher Education Institutions.*

***Strengths:***

*1) There is a large proportion of young academic staff (70% are under fifty years of age).*

*2) Academic staff has high qualifications which ensures theoretical and research potential - 80% have the degree of Doctor of Engineering or a different doctoral degree (PhD).*

*3) Most staff members involved in teaching possess a strong professional industrial background, which enhances the transfer of practical knowledge to the students enrolled in the professional bachelor programme.*

*4) The study process involves guest lecturers - specialists from the industry and enterprises who, within corresponding study courses, provide specific knowledge and share their experience.*

***Weaknesses:***

*1) In order to further strengthen relationships with professionals from other higher education institutions and provide students with opportunities to explore new careers in academia and research, both incoming and outgoing mobility must be enhanced.*

**Evaluation of the requirement [R2]:**

| Requirement | Compliance | | | Justification |
|---|---|---|---|---|
| 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 of the laws and regulations. | Fully compliant | Partially compliant | Non-compliant | *The teaching staff's qualifications align effectively with the study program.*<br><br>*Their industry expertise ensures a strong connection between theoretical knowledge and practical application.*<br><br>*However, to foster stronger relationships with professionals from other higher education institutions and to offer students more opportunities in academia and research, both incoming and outgoing mobility should be improved.* |
| | x | | | |

**Requirement [R3]:** 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 artistic creation (if applicable).

**Analysis**

*Not applicable*

***Conclusions, Strengths, Weaknesses:***

*Not applicable*

**Evaluation of the requirement [R3]:**

| Requirement | Compliance | | | Justification |
|---|---|---|---|---|
| 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 artistic creation (if applicable). | Fully compliant | Partially compliant | Non-compliant | Not applicable |
| | | | | |

**Requirement [R4]:** Compliance of the study programme with the requirements of the Law on Higher Education Institutions and other laws and regulations.

| No. | Requirement | Fully compliant | Partially compliant | Non-compliant | Justification |
|---|---|---|---|---|---|
| 1. | The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard, including the minimum requirements for the content of the compulsory civil protection course and the content of civil protection training for employees specified for the implementation of the study programme.<br><br>The study courses of the professional study programmes include a module for the development of professional competence of entrepreneurship in the amount of at least 6 CP, if it has | *x* | | | *According to the initial report supplement 3.6. "Compliance with the State Education Standard" and the document "Study programme "Smart Power Systems"" provided by RTU Study programme complies with the Latvian Cabinet of Ministers Regulation 512. "Regulations on the State Standard for Second-Level Professional Higher Education".* |

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| | not been acquired in the previous professional study programme or is not included in the theoretical basic courses of the study programme branch (field of professional activity). | | | | *General Education Study Courses (14 CP)*<br><br>*Field-Specific Theoretical Basic and IT Study Courses (39 CP)*<br><br>*Field-Specific Professional Study Courses, including Compulsory Elective Study Courses (61 CP)*<br><br>*Humanities and Social Sciences Study Courses (4 CP) and languages (4 CP)*<br><br>*Free Elective Study Courses (6 CP)*<br><br>*EES728 Practical Placement (20 CP)*<br><br>*EES723 Bachelor Thesis with Project (12 CP) as the Final examination*<br><br>*Compulsory civil protection course and the content of civil protection training for employees: ICA301 Civil Defence (1 CP) and IDA304 Occupational Safety and Environmental Protection (2 CP)*<br><br>*Module for the development of professional competence of entrepreneurship: SDD700 - Innovative Product Development and Entrepreneurship (6 CP)* |
| 2. | The study programme complies with a valid professional (occupational) standard, or with the requirements of professional qualification (if it is not necessary to develop a professional standard for the profession), if a professional qualification is awarded after acquisition of the study programme | *x* | | | *According to the initial Report supplement 3.7. "Compliance with the Professional Standard" and professional occupational standard "Electric Engineer" (date of approval - 11.08.2021, code 2151 01)* |

| | | | | | |
|---|---|---|---|---|---|
| 3. | The code of the study programme complies with the Cabinet regulations on the Latvian Education Classification | *x* | | | *According to Ministru kabineta noteikumi Nr. 322 Rīgā 2017. gada 13. jūnijā (prot. Nr. 30 18. §) "Noteikumi par Latvijas izglītības klasifikāciju"*<br><br>*42522 - Professional bachelor study programme (second level professional), Engineering science, production and construction; Engineering science and technologies, Energetics* |
| 4. | The qualification of the teaching staff [1] complies with the conditions and requirements set for the implementation of the study programme, which are specified in the regulatory enactments in the field of education including the participation in the implementation of an academic study programme of at least five professors and associate professors together who have been elected to academic positions in the respective higher education institution, except in the cases provided for in Section 55, Part two of the Law on Higher Education Institutions. | *x* | | | *Supplied list of teaching staff (supplement 3.2 "List of academic staff" to the Report) consists of 60 persons, 47 or 78% are with doctoral degrees; 48 or 80% are elected and 29 or 48% are professors and associate professors.*<br>*According to information given by programme director A. Dolgicers 95 % of teaching staff are also connected to industry (e.g. have additional work place).* |
| 5. | Confirmation of the higher education institution/college that the teaching staff members to be involved in the implementation of the study programme have at least B2-level knowledge of a related foreign language, according to the European Language Proficiency Assessment levels (the division of levels is available on the website www.europass.lv), if the study programme or any part thereof is to be implemented in a foreign language **or** proficiency of the Latvian language at least on the C1 level, if the study | *x* | | | *Confirmation of Vice-Rector for Academic Affairs U. Sukovskis "On the foreign language proficiency of the teaching staff involved in the implementation of the professional bachelor study programme "Smart Power Systems"".*<br>*Note: there was a translation problem in the English version of the Confirmation due to which it was incorrectly confirmed, that all teaching staff involved in* |

[1] *As used in this document, the term "teaching staff" refers to the academic staff and visiting professors, visiting associate professors, visiting lecturers, visiting lecturers, and visiting assistants of the corresponding higher education institution / college.*

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| | programme or a part thereof is intended to be implemented in the Latvian language and the lecturer has not acquired secondary or higher education in the Latvian language. | | | | *implementation of the programme have at least B2 level of proficiency in English. Latvian version however correctly states that only those who take part in implementation of the English version of the programme have the required B2 proficiency level. According to supplement 3.2 "List of academic staff", programme director confirmation letter about studies of Breners Nikolajs, Buņina Inna and Hramcovs Vladimirs in RTU in Latvian and Hramcovs Vladimirs CV all academic staff have Latvian proficiency level at least C1, have Latvian as native language or have completed higher education studies in Latvian.* |
| 6. | The study programme, which is intended to be implemented in a foreign language, complies with the requirements of Section 56, Part three of the Law on Higher Education Institutions | *x* | | | *Taking into account study field in which the Study Programme is planned to be included, the evaluation of the Study Programme (which is Excellent) as well as its goals, the expert panel strongly believes that the Study Programme must be implemented in English. This is especially true since it meets the requirements of Section 7 of Article 56 of the Higher Education Law, which mandates Latvian language study courses for foreign students (Annex 3.8. Study plans).* |
| 7. | The sample of the study agreement complies with the mandatory provisions to be included in the study agreement (if applicable). | *x* | | | *Information has not changed since licensing procedure.* |
| 8. | The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure by which state recognised | *x* | | | *Information has not changed since licensing procedure.* |

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| | documents of higher education are issued (if applicable). | | | | |
| 9. | The higher education institution/ college has confirmed that it will provide the students with the options to continue the acquisition of education in another study programme or at another higher education institution/ college (a contract with another accredited higher education institution/ college), in case the implementation of the study programme is discontinued (if applicable). | *x* | | | *Confirmation of Rector L. Ribickis "Confirmation of the possibility for students to continue their education between the professional bachelor study programs "Adaptronics", "Computerised Control of Electrical Technologies" and "Smart Power Systems"".*<br>*It is to be noted, that according to RTU homepage only "Adaptronics" and "Smart Power Systems" are both in Latvian and English. So, for English students there will be only one option to change their study programme, for Latvian students - 2.* |
| 10. | The higher education institution/ college has confirmed that it guarantees to the students a compensation for losses if the study programme is not accredited or the licence of the study programme is revoked due to the actions of the higher education institution/ college (actions or omissions) and the student does not wish to continue the studies in another study programme (if applicable). | *x* | | | *Information has not changed since licensing procedure.* |
| 11. | 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.<br><br>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). | | | | *Not applicable.* |
| 12. | The scientific and pedagogical qualification of doctors of science complies with the criteria specified in the regulatory enactments regarding | | | | *Not applicable.* |

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| | the evaluation of the scientific and pedagogical qualification of a candidate for the position of a professor and an associate professor (if applicable). | | | | |
| 13. | The joint study programme complies with the requirements prescribed in Section $55^1$, of the Law on the Higher Education Institutions (if applicable). | | | | *Not applicable.* |

**Evaluation of the requirement [R4]**:

| **Requirement** | **Compliance** | | | **Justification** |
|---|---|---|---|---|
| Compliance of the study programme with the requirements of the Law on Higher Education Institutions and other laws and regulations. | Fully compliant | Partially compliant | Non-compliant | *Experts have found, that according to the initial Report, supplement 3.7. "Compliance with the Professional Standard", 3.6. "Compliance with the State Education Standard", 3.2 "List of academic staff", Confirmation of Rector L. Ribickis "Confirmation of the possibility for students to continue their education between the professional bachelor study programs "Adaptronics", "Computerised Control of Electrical Technologies" and "Smart Power Systems"" and additional information provided by the programme director the programme is fully compliant with Law on Higher Education Institutions, Latvian Cabinet of Ministers Regulation 512. "Regulations on the State Standard for Second-Level Professional Higher Education" and* |
| | x | | | |

| | | | | |
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| | | | | *relevant academic and professional standards.* |

## 4. Implementation of the recommendations received during the licensing of the study programme

Assessment of the implementation of the recommendations provided by the licensing experts of the study programme.

**Analysis:**

*Not all short-term recommendations for improving descriptions of study courses have been implemented. Work still should be done in the following courses: EEE202, DMF101, DIM205. For the unimplemented recommendations Report supplement 3.4 "Overview report on implementing recommendations" gives status "The activity is being implemented on a continuous basis; in progress" and implementation process is commenced. Changes made so far can also be discussed. For example, literature in English added to course "Mathematics" (DMF101) covers topics of the course only partly, no literature is given about complex, differential and integral calculus. Formatting of online sources in the list of literature also could be improved by adding "title", "author", "viewed" fields. "Electrical Machines" (EEM212) has been improved by increasing the number of contact hours for part time studies as for information from RTU study course catalogue (https://stud.rtu.lv/rtu/discpub/oe.8400), but the initial Report (supplement 3.4 "Overview report on implementing recommendations") still gives planned deadline "Commenced" for this recommendation. It is possible that there are some additional formalities in RTU to complete it.*

*Improvements according to long-term recommendation No 1 were mostly successful and regarding new lab equipment and use of simulation software also confirmed by students.*

*University does not plan to implement long-term recommendation No 2. Necessity of the recommendation may be arguable, however there was no justification in the overview of recommendations, why RTU does not plan to implement it. In experts opinion, the decision not to implement this recommendation is a valid decision as course fragmentation risk is not relevant and students have opportunity to better tailor compulsory elective courses (B part of the programme) to their needs.*

*Long-term recommendation No 3 regarding improvement of laboratory equipment to support specified data exchange protocols is partly implemented, equipment is achieved and work is in progress on methodological materials.*

*Long-term recommendations No 4-5 are fully implemented: laboratory stand for smart building based on KNX protocol was demonstrated during on-site visit; and the professional standard was improved.*

*Long-term recommendation No 6 implementation is commenced. Although it is not possible right now for students to take an electrical safety category examination in compliance with Regulation No. 1041 of the Cabinet of Ministers "Regulation on the compulsory energy standard that sets the organisational and*

*technical safety requirements for the operation of power supply facilities" in RTU, agreement is signed with the training centre for students to be able to take the examination. According to additional information provided upon request by email from RTU, training is provided by AS "Sadales tikls" training centre, Riga, Ventspils street 58 (https://sadalestikls.lv/lv/par-macibu-centru).*

*Long-term recommendation No 7 is in progress, a plan of modularisation of study course list in the program has been developed.*

*University does not plan to implement Long-term recommendation No 8 justifying this by student self-government opinion that it is unacceptable to make a survey compulsory, because it will lose its quality. In experts opinion the justification and the decision not to implement this recommendation is valid.*

*Work has been started regarding implementation of Long-term recommendation No 9 by cooperation commencing with the International Cooperation and Foreign Students Department to address the problem regarding the adaptation of foreign students.*

*Work is in progress also for Long-term recommendation No 10. During on-site visit several interviewed employers stated that there should not be a problem to integrate English-speaking internship students in their enterprises.*

*RTU has proposed detailed solutions to implement Long-term recommendation No 11. In order to ensure a unified understanding regarding the basic issues in implementing the study course, the teaching staff member in charge will have to organise the joint work of all the teaching staff involved and help them understand the tasks of the study course and the expected learning outcomes. The study process also actively involves PhD students from the Institute of Power Engineering with a good command of English. Activities are still in progress.*

*Implementation of Long-term recommendation No 12 has been started. Teaching staff are encouraged to use the CV automated generation system provided by RTU.*

*In experts opinion Long-term recommendation No 13 implementation is successful as both program director and students confirmed during interviews that there are guest lectures held by representatives from industry enterprises.*

***Conclusions:***

*Mostly recommendations are implemented. Progress of still not implemented Long-term recommendations is well described in the Report supplement 3.4 "Overview report on implementing recommendations", and from experts point of view these recommendations could be implemented in a deadline without significant difficulties. There are also two cases, where recommendations are not planned to be implemented, in experts opinion both are justified and valid.*

***Strengths:***

*None*

***Weaknesses:***

*1) Short-term recommendations regarding description of study courses are marked as completed or started to be implemented, however formal requirements regarding bibliography items in English for courses EEE202, DMF101, DIM205 are still not met.*

# III. Assessment of the study programme

| x | Excellent |
|---|---|
| | Good |
| | Average |
| | Poor |

# IV. Recommendations

| x | **experts recommend that the study programme be included in the accreditation form within this study field** |
|---|---|
| | experts do not recommend including the study programme in the accreditation form within this study field |

***Short-term recommendations:***

*1) To ensure the enrolment of students to the English language program within the curriculum, RTU needs to develop a strategy for attracting foreign students within a two-year timeframe.*
*2) To move program description, study plan and course descriptions from Latvian Credit Points to ECTS until 31st December of the year 2024 (Law on Higher Education Institutions) to comply with the Cabinet of Ministers Regulation No. 305 (13.06.2023).*
*3) To complete improvements regarding study courses given in short-term recommendation No. 5 during licensing.*

***Long-term recommendations:***

*1.Given the limited number of students in the English version of the study programme, RTU needs to reassess the need for maintaining the English version of the program within a four-year timeframe.*