Expert group joint opinion

Evaluation Procedure: Assessment of Study Field

Higher Education Institution: Transport and Telecommunication Institute

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

Experts:

1. Ilmārs Blumbergs (Chair of the Experts Group)
2. Giovanni Battista Palmerini (Secretary of the Experts Group)
3. Neethu Xavier Akkara
4. IVANS GOROBECS (Employers' Confederation of Latvia)
5. Rinalds Seržants (Student Union of Latvia)

Summary Assessment of the Study Field

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Concluding the analysis of the study field, experts did not identify any deficiencies, which cannot be eliminated in two years' time. Overall, Transport and Telecommunication Institute (TTI) and its managed study field "Mechanics and Metal Processing, Heat Power Engineering, Heat Technology, and Mechanical Engineering" (study field) under review with its 1 academic study programme ensures the compliance of legal requirements and shows good management and quality assurance practices. Experts have also identified several necessary and recommended improvements. The major positive aspects of the study field are: The aims of the study field are well structured, gradually cascaded through the respective study programme, strongly linked to TTI and national development strategies, shows clear awareness of the necessary linkage to labor market and entrepreneurial business environment and are proved to be attainable, the structure and the management process is efficient with "flexible micro administration" allowing all administrative management and academic structures and personnel to be involved in operative discussion and efficient decision-taking through weekly and monthly management meetings, overall good management and clear organizational, administrative management structure and processes in a flexible, strong and internally cooperative team of enthusiastic and qualified academic and administrative staff. Good cooperation and team spirit among teaching staff. Teaching staff shows enthusiasm and clear awareness of necessity to combine academic and scientific work. Students, graduates, teaching staff, employers are all referring positively about the study programme are loyal, empathic and satisfied. TTI shows good student-centred approach, individual approach in study process and course materials, sufficient technical resources and infrastructure is available for all students, as well as possible involvement in scientific research. Students also are involved in various management structures (e.g. Council) within elected places and have the chance to shape the study process. Study field is very well equipped for practical training and opportunity for the students to pass special licensed Aviation courses is must be mentioned as good practice. The Erasmus + project activities are very well provided.

The few major weaker points and current best practices to consider followed by recommendations relate to: budget that has been allocated for study materials, scientific infrastructure and other similar costs (scientific costs in general) is too low to ensure scientific development, most of scientific projects are applicable to other fields of science - most often in logistics, students and academic staff do not know scientific databases offered be TTI, there is week feedback from graduates and industry via surveys, there is also a large average percentage of "drop-out" of the students in the study programme.

1. Management of the Study Field

Analysis

1.1

The aims of the study field are clearly and strongly linked to Transport And Telecommunication Institute (TTI) Development strategy - The strategic TTI aim is to make TTI a modern international technical university with a competitive set of higher education programs, a research and innovation plan, and a lifelong learning offer that meets the needs of all our target groups - students, employees, partners, our society and the region. In its development strategy for 2020-2025, TTI has identified five strategic priorities: international involvement, education, research and knowledge transfer, business and society involvement, personnel.

The aim of international involvement is to increase the number of foreign students and increase the level of student preparedness by strengthening the TTI position as a leading private university in the Baltic Sea Region that offers higher education in computer science, transport, logistics and aviation. Establish a strong and deep strategic partnership with a British university, thereby enhancing the set of TTI study programs and research projects.
The aim of education is not only to develop study programs in computer science, transport, logistics and aviation, to attract an international audience by providing studies in a flexible format in English, but also to offer a wide range of lifelong learning opportunities.
The aim of research and knowledge transfer is to train graduates that meet the demands of the industry and of the changes in business operations, business organizations and public life of the next industrial revolution. As for the research area, there will be set up an appropriate number of targeted, multidisciplinary research clusters addressing key societal challenges that might have a national or international impact.
The business and society involvement involves strengthening partnerships with employers in the region so that the TTI study programs are based on the needs of partner companies and provide internship opportunities for TTI students. It also focuses on encouraging partners to contribute to the enhancement of the TTI research programs and share the essential information so that research results have an impact on business and bring positive changes to society.
The aim of staff development (personnel) is to attract and develop excellent staff as well as to provide all employees with opportunities and support for personal development and high performance.
The full Strategy of the Transport and Telecommunications Institute for 2020-2025 is available on the TTI website in Latvian and English at https://tsi.lv/wp-content/uploads/2020/07/TSI-Strategy-2020-2025.pdf.
The aim of the TTI study program Academic Bachelor's program Aviation Engineering Bachelor of Engineering in Aviation Transport -To train internationally competitive specialists in aviation engineering, providing theoretical knowledge and developing practical skills in aircraft maintenance in the areas of mechanics and avionics, and to prepare graduates for further studies in higher level programs and further self-education.
The aims of the study field are well structured, gradually cascaded through the respective study programs, strongly linked to TTI and national development strategies, shows clear awareness of the necessary linkage to labor market and are proved to be attainable.
The aims of the study field are strongly linked to, fully incorporated in and are an integral inalienable part of the TTI strategic priorities thus contributing highly to the achievement of these priorities. The Constitutional Assembly, Senate, Audit Committee, Academic Arbitration Court, Board, Rector, Vice-Rectors, Student Self-Government, Faculty Councils and Study Direction Councils of TTI in cooperation with the Supervisory Board of the JSC TTI appointed by the founders is working on the development of the strategy for 2021-2025, in the process of which a new development plan of the study field is elaborated in accordance with the newly defined goals for strategic priorities. In turn, the Management Board of the TTI ensures the implementation of the decisions of the Supervisory Board as well as the management and control of the operational activities of the Joint Stock Company.
The study field and its programs are in high compliance with the development trends of the society and national economy. This is again ensured by strong linkage between study field and TTI strategic priorities as well as by strong cooperation with the Aviation Institutes/Universities, industrial companies (https://tsi.lv/about-us/partners/) and the strong involvement of the study field programs in TTI applied and scientific projects and entities namely iDEAHUB is the Centre of innovation and entrepreneurship at TTI. iDEAHUB supports the implementation of the “Grants for Students Innovations” project with such activities as training, innovation projects competitions, and others (https://tsi.lv/research/projects/ideahub/),

(https://tsi.lv/sites/default/files/editor/transport_and_telecommunication_institute_research_programme_final_website.pdf).

1.2.

The structure of the TTI management and administration is clearly levelled and with well distributed roles facilitating its orientation toward continuous improvement of the study programme (https://tsi.lv/about-us/structure-and-government/). At the same time TTI positively and justifiably refers to itself as “flexible micro-administration” allowing all administrative management and academic structures and personnel to be involved in operative discussion and efficient decision-taking through weekly and monthly management meetings. Furthermore, there is a visible student-centered approach also in the management and administration of the study field as the students` board is involved in the management discussions and decision-making.
The assessment system of the students' achievements and study results is stipulated in the external laws and regulations: the Law on Higher Education Institutions and the Law on Education, and in several internal regulations:
 Study Regulation;
 Rules of Study Procedure;
 Regulation on Awarding a Professional Bachelor’s Degree, Professional Master’s Degree and Professional Qualification;
 Regulation on Awarding Academic Bachelor's and Master's Degrees;
 Regulations on Final Examinations;
 Rules for Grading the Final Examination Papers;
 Internship Regulation;
 Methodological Guidelines for Designing the Final Examination Thesis and Methodological Guidelines for Internship.
Different study methods and forms are used in the study process. The main criteria for the selection of training methods include the necessity to ensure the acquisition of required information and development of critical attitudes as well as the general need to attain the expected learning outcomes (specific knowledge, skills and competences).

At the same time, during the visit at TTI experts detected a slight misinformation among major groups involved - study field director, TTI management, and teaching staff - including on the topics related to quality assurance of the study programme (e.g. course and their description audits (annual updates); study results mapping of the study programs, and further collection of studies and science information from teaching staff). Given the efficient characteristics of the study field management process mentioned above, experts believe that slightly stronger cooperation in information exchange and management among all, particularly and teaching staff, will also open new best practices to improve the achievement of study results. Overall, the experts group noted very good team spirit and motivation, loyal internal micro-climate of all major groups, including students and teaching staff, each group referred expressly positively to one another, showing efficient internal information exchange and management, including on the realistic approach and adaptation to business environment trends through study process (e.g. strong industry cooperation) and research.

1.3

Matriculation of students at TTI is determined by the Admission Regulations, which are approved by the Senate and published on the TTI website by 1 November of the current year. According to these regulations, students are admitted to study programs.

TTI has developed the Registration and Admission Procedure of Applicants, describing all registration and admission procedures, with a particular focus on foreign students.
The Admission Committee is set up for the admission of students for each admission year.
At the beginning of studies, the Student Service shall acquaint students with the Code of Ethics, and other internal regulations shall be presented to the students at the Organizational Meeting.
The study programs are implemented in accordance with the study plan approved annually by the rector. A list of classes is made for each semester and is publicly available to students and the faculty staff.
The Studies Department evaluates and recognizes study courses acquired at other higher education institutions in accordance with the procedure established by TTI, in accordance with the Regulations on Admission to the Later Stages of Studies.
Admission to TTI is based on the Admission Rules approved by the TTI Senate for a particular academic year. Admission Rules for the 2021-2022 academic year approved by the TTI Senate on 20 October 2020 (available at: https://tsi.lv/wp-content/uploads/2020/12/uzn%CC%A7ems%CC%8Canas-noteikumi-2021-2022_jk-2_eng.pdf). Admission Rules have been developed and admission proceeds in accordance with external laws and regulations - the Law on Higher Education Institutions, Cabinet Regulation No. 846 of 10 October 2006 Regulations on Requirements, Criteria and Procedures for Admission in Study Programs, Cabinet Regulation No. 543 of 29 September 2015 Provisions for the Substitution of a Foreign Language Centralised Examination in the General Secondary Education Programme for a Foreign Language Examination by an International Testing Institution, as well as other external laws and regulations and the TTI Constitution.
Admission to later stages of studies at TTI is based on Cabinet Regulation No. 932 of 16 November 2004 Procedure for the Commencement of Studies in Later Stages of Studies, Cabinet Regulation No. 505 of 14 August 2018 Regulations for the Recognition of Competences and Vocational Education and Training Acquired Outside Formal Education or Professional Experience and the Study Results Achieved in the Previous Education, the TTI Regulations on the Recognition of Competences and Vocational Education and Training Acquired Outside Formal Education and the Study Results Achieved in Previous Education, the TTI Procedure for the Commencement of Studies at Later Study Stages and other external laws and regulations.
Learning outcomes achieved in the previous education or professional experience are recognized in accordance with the Regulations on the Recognition of Competences Acquired outside Formal Education or in Professional Experience and Learning Outcomes Achieved in the Previous Education
Recognition of learning outcomes achieved during the ERASMUS+ program is governed by the TTI ERASMUS+ Program Scholarship Contest Manual.
In TTI internal information system Intranet has a student card opened for each student. This card is an identity card, which reflects all the information about the student's study progress, his/her study plan for the entire study period and the assessment of study results, allowing the student to control the implementation of the study plan.

1.4

The TTI has developed the Code of Ethics (available at:https://tsi.lv/sites/default/files/editor/Dokumenti/Oficialie_Dokumenti/ethical_charter.pdf). The Code of Ethics defines the basic principles of ethics and conduct for administrative, scientific, and research staff, as well as students, creating a favorable, respectful and responsible working environment at the Institute. The Code of Ethics includes core principles and standards of conduct to be complied with by students and employees in their attitude to the Institute, their work and in relations with their colleagues, clients and business partners. The general principles of ethics are the principles of honesty and justice, responsibility and loyalty, respect and collegiality.

The Ethical Commission is established on the basis of an order which shall assess complaints regarding a failure to comply with the core principles of professional ethics and conduct.
Students are introduced to the principles of academic integrity, adherence thereto during their studies, and any sanctions for non-compliance with these principles from the beginning of the study process in the first introductory lecture. The Personnel Department introduces employees to the Code, while employees confirm becoming acquainted with the Code with their signature. The Code of Ethics of the Institute is available to all students, employees of the Institute as well as the public on the Institute's webpage.
TTI conducts regular student surveys, and students have an opportunity to express their views anonymously on the professional level of lecturers and on adherence to the Code of Ethics. These results are taken into account when planning the improvement of lecturers' work quality.
TTI acts in accordance with the principles and rules of good faith and responsible conduct described in the TTI Plagiarism Control Regulations (available at: https://tsi.lv/wp-content/uploads/2021/05/plagiata-kontroles-noteikumi-proj-mms-eng.pdf). The regulations set out the procedures for identifying plagiarism in the papers of TTI students, including self-plagiarism, and the criteria on the identification of violation and on the applicable sanctions.
For a long time, TTI used the Unified Computer Plagiarism Control System developed by the University of Latvia, which did not allow for full and high-quality checking of all students' papers and final theses for plagiarism, taking into account the rapid increase in the number of students studying and submitting final theses in English. At the beginning of 2020, TTI purchased a new anti-plagiarism program and since the end of May, all TTI faculty members and students have been using Turnitin®, the world's leading tool for correcting papers and preventing plagiarism.
TurnitIn® is integrated into the TTI e-learning system Moodle and provides a full service for submitting, correcting, determining the originality (plagiarism) of content and returning submitted papers. Upon submitting their papers to Moodle, students immediately receive the assessment of the TurnitIn® system on similarities of their papers with other sources.

1.5

The information provided by TTI publicly on their homepage (https://TSI.lv) is available in Latvian and English, and is fully sufficient for attracting potential students, and fully covers the planned target audience of the study programme implemented. The information complies with the information available in the official registers. TTI is a well-known and highly recognized higher education institution within the Baltic States, and visibly promotes the recognizability and its prestige through smart integrated marketing communication, including on its homepage (https://TSI.lv).

Conclusions. Strengths and weaknesses

The aims of the study field are well structured, gradually cascaded through the respective study programme, strongly linked to TTI and national development strategies, shows clear awareness of the necessary linkage to labor market and entrepreneurial business environment and are proved to be attainable(1). The structure and the management process is efficient with "flexible micro administration" allowing all administrative management and academic structures and personnel to be involved in operative discussion and efficient decision-taking through weekly and monthly management meetings, however communication and information exchange with the teaching staff needs to be slightly strengthened (2). The academic procedures correspond fully to the legal requirements, are logical and efficient, and supplemented with the necessary legal internal documentation (3). The academic integrity and ethics principles are well established, legally set and effectively used (4). The information published on the website is elaborate, detailed and full-fledged

(5).

Strengths
1. Strong linkage between study field aims and TTI Development Strategy.
2. Efficient, all-involving and flexible micro-administration, management and the decision-making of the study field.
3. Fully integral support of administrative and technical structural units to the contents development and the practical implementation of the study programme.
4. High recognition of TTI and their positive impact within the Baltic region.
5. Overall very good team spirit and internal micro-climate of all major groups, including students and teaching staff, on all level programs and thus realistic approach to business environment trends.

Weaknesses.
1. Slight misinformation among major groups involved -study field director, TTI management, and particularly teaching staff.

2. Efficiency of the Internal Quality Assurance System

Analysis

2.1 TTI defined and fielded a quality assurance system, that has been ISO certified. Such a system is not implemented as a one-time exercise, yet as a living instrument, intended to take into account an evolution of the quality procedures according to the changes in the relevant opinions and needs as well as to newly emerging requirements (the more recent revision of the quality insurance plan has been approved and published in 2021). The quality handbook, an excerpt stating quality concepts as understood by TTI and the guidelines to their application, as well as a relevant personnel policy are all available in Internet, and quickly reachable from the main menu in an intuitive way (from website “tsi.lv” main page to “about us” then “official documents”). The aims and measures to increase the quality of the study programme for the next several years have been duly detailed, and the relevant actors identified.

2.2 Overall, the adopted quality assurance system seems logical and effective, partitioned in levels and composed by several processes (Fig.6, page 13 of the Self-assessment document presented for the accreditation). During the course of the preparation, approval and update of the quality plan, the system is capable to include and to give attention to instances from all stakeholders, especially as far as it concerns faculty and students who can directly act at the level of Senate. Other stakeholders like university staff, industry, alumni, could certainly act, if interested, through different intermediate consulting bodies participating in the quality plan definition process, even if their participation is not especially clear from the existing documentation (see Fig.4, page 12, of the Self-assessment document).

2.3 A careful analysis of the current state of the study programme, of the services offered, of the possibilities to be pursued has been carried on and reported. Therefore, it could be deemed that, in principle, that the institution collects and analyses the information (statistics) on the relevant study programmes of the study field on a regular basis and efficiently uses it to improve the study field.

However, a direct input from students' (or graduates') feedback could not be confirmed during some interviews. This occurrence can be partly justified by difficulties in motivating students to answer the poll, as well as in tracking graduates once they leave the university. As feedback received is obviously important to improve the educational process, a continuous effort in approaching full participation in surveys has to be looked for and maintained.

In addition, with respect to the overall quality level achieved, it is necessary to make sure that the real Latvian language knowledge corresponds to the presented one, because several lecturers with C1 level Latvian language knowledge had a number of language errors in the descriptions of study courses (section "Student's independent work"). To the commission's request to show Latvian language proficiency certificates, the TTI management replied that they could not do so in order not to violate the personal data protection law.

2.4 TTI as institution shows knowledge and sharing of ESG (Standards and Guidelines for Quality Assurance in the European Higher Education Area) principles. In addition to the self-assessment documentation presented for the accreditation process, this adhesion has been proofed by discussion during visits. Opening to other approaches followed at universities abroad, attention to exchange programs like Erasmus, partnership with a UK university, admission of international students are all elements supporting such a positive judgement. Once noticed that the ultimate goal of ESG is to preserve and improve the quality of higher education through exchange, recognition, mobility, a very good example of the TTI attention to the process is given by the remark, offered by the institution, that admission of foreign students has to be considered with some attention (p.132 of the Self-Assessment document: “Although the selection of foreign students, especially from India, proceeds very carefully, not all foreign students are able to meet the requirements for the assessment of study courses.”)

Conclusions. Strengths and weaknesses

The quality system adopted at TSI is (more than) satisfactorily built, takes into account all foreseeable ingredients and allows for a continuous evolution to maintain a quality standard.

Strengths:
1. The quality system is well elaborated and certified.
2. Documents are publicly available and easy to access through the institution's website.

Weaknesses
1. Different stakeholders can, at least in principle, participate in the process, but the right venue for their input is not fully clear, except for faculty and students who have their own voice at the Senate, where some important steps for quality plan definition and approval take place.
2. The use of students’ or graduates’ surveys could not be confirmed.

3. Resources and Provision of the Study Field

Analysis

3.1

TTI has developed a a system to determine the financial resources required for the implementation of the study field and the relevant study programmes. In accordance with the financial management and accounting policy of the Transport and Telecommunication Institute, TTI budgeting is performed both in the short term (per calendar year) and in the long term (up to 5 years), separately forming the budgets of financial responsibility centres. Two approaches to budgeting are used: top-down and bottom-up. The finances of the direction and the program are controlled by the dean of the faculty. In 2018-2020, only 3% of the total funding of the direction (2% in previous years) has been allocated for study materials, scientific infrastructure and other similar costs, which amounts to approximately

6750 Euros per year. Infrastructure supporting grants due to their unpredictable matter can not be main source of funds for science development and support. As from self evaluation report no other regular sources for funding of scientific activities than percentage from total funding can't be found then to regularly support 32 persons publications, business travels and participation in high quality conferences, to buy materials an to make maintenance of equipment, to calibrate them, then it is definitely not enough even without purchasing new equipment or paying salaries for laboratory assistants or other support staff.
Overall study process is profitable and in year 2020 profit from one student was 627 Euros

3.2

The TTI has identified the infrastructure resources and material and technical support necessary for the implementation of the study field for the practical implementation of the program. TTI has a very good material and technical provision for the practical classes. But the scientific equipment and the amount of scientific research in the respective field of study (Mechanics and Metalworking, Thermal Power Engineering, Thermal Engineering and Mechanical Engineering) can be assessed as weak. During the reporting period, a relatively large amount of equipment for practical classes has been purchased, but despite the recommendations expressed in the previous accreditation, scientific equipment corresponding to those fields of science has not been purchased. The academic staff of the evaluated field has been involved in a sufficient number of scientific projects, but, for the most cases, these projects are applicable to other fields of science - most often in logistics.
Within the framework of the project "Modernization of STEM study programs of the Institute of Transport and Communications" the premises have been renovated, the provision of multimedia, study literature and databases, distance learning, etc. has been improved. equipment (2017-2020). Although TTI staff and students have access to databases such as Academic Complete, Elsevier, Scopus, their names could not be named by the academic staff, students or graduates, which indicates the poor use of this resource. The most electronic resources used by students are e-books and study materials placed in the TTI electronic system and library. In general, the provision of modern literature relevant to the direction is sufficient.

3.3

The application and selection procedure for the academic staff of TTI is regulated by the “Regulations on the election of the academic staff by competition” (available at: https://tsi.lv/wp-content/uploads/2020/12/nolikums-par-ak.-personala-ievelesanu-1 .pdf). Academic staff are informed of the criteria they must meet in order to be re-elected or elected to senior positions. The teaching staff can follow the workload of the teaching staff in the electronic system of TTI. During the interview, the lecturers were familiar with the operation of the system and did not provide any negative information regarding the imbalance of academic and research workload.
TTI has defined and implemented a system for the promotion of scientific research and / or artistic creativity, and the academic staff of the field of study is informed about it and uses it. Staff development activities are planned, and teachers use Erasmus + mobility opportunities. Network of Erasmus+ partners is well established. The directions of personnel development are stipulated in the TTI Personnel Policy (available: https://tsi.lv/wp-content/uploads/2021/05/personala-politika.pdf), specifying the measures of professional development and professional development of the academic staff in the professional development planning of the TTI academic staff. in the organization program (approved on 15.04.2014, order No. 01-12.1 / 35, available in TTI Record Keeping System).
The theoretical balance between research and academic work (Table 17 of the study direction description. Academic and research workload of the academic staff) should be assessed as optimal, but the number of academic staff (20) indicated in the table does not coincide with the number

implementing the program (32) (Appendix 11). and TTI did not respond to the request to show the concluded research contracts, which could show (approve) the workload of the staff involved and the work to be performed.

3.4

When students start their studies, a handbook is issued so that students from the first day of studies know where to turn if they have any questions. Students are supported in technical matters by the IT department. A centralized support for the study process and information structure has been established - a helpdesk, which accepts applications, processes them and gives instructions to the support staff on duty. Very positive is that TTI has Foreign Student Coordinator, whose responsibility it is to give advice on the study process organization, behavioral and ethical issues at TTI, entry and accommodation in Latvia (places of residence, hotels, shops, pharmacies, medical institutions, the Office of Citizenship and Migration Affairs, etc.

Conclusions. Strengths and weaknesses

Study fields resources and provision are very good with only one weak point - scientific activities. TTI laboratory equipment, library, data bases, premises, academic staff and support for the students is very good. If there would be only professional programs in the study field then overall assessment would be very good, but because for academic programs emphasis is on corresponding scientific activities then study fields resources and provision can be assessed as good.

Strengths:
1. TTI has a very good material and technical provision for full-fledged practical training
2. The TTI library is well equipped with professional literature in paper and e-book form and appropriate databases in English.
3. The premises and working conditions are good
4. The academic staff is professional, active and international
5. TTI takes care of successful adaptation of foreign students for living and studies in Latvia
5. Support for students is sufficient and effective

Weaknesses:
1. In context of that the only study programme in this study field is the academic program, the allocation of 3% of all costs to teaching materials, scientific infrastructure and other similar costs (approximately EUR 6750 in 2020) is considered to be too low.
2. Weak level of scientific equipment in the represented scientific fields
3. Insufficient use of scientific databases by staff and students

4. Scientific Research and Artistic Creation

Analysis

4.1
TTI has a strong emphasis on scientific research as per the strategic plan approved in 2015, TTI Strategy and Research Programme 2015-2020 for the development and contribution towards the study field. A significant level of thought and consideration has gone into the creation of goals that not only applies research outcomes to the educational program but also contributes to the socio-economic scenario. The research work is formed in accordance with the Law on Scientific Activity where the Scientific and Doctoral Council is in charge of making the strategic decisions which are

then integrated into the day to day activities by the Research Administration Division under the supervision of the Vice-Rector for Academic Affairs and Research. To supplement the above, an International Scientific Advisory Board is established by the TTI which consists of members from an international background and this consultative body makes recommendations on the development and its progress is reported every year. The implementation of scientific research in the study field predominantly happens through participation in both international and regional projects and a good number of which are cited. During the visit, the internal working and the various measures taken to ensure the quality process was seen. However the scientific equipment and the amount of scientific research in the respective field of study (Mechanics and Metalworking, Thermal Power Engineering, Thermal Engineering and Mechanical Engineering) can be assessed as weak. During the reporting period, a relatively large amount of equipment for practical classes has been purchased, but despite the recommendations expressed in the previous accreditation, scientific equipment corresponding to those fields of science has not been purchased. The academic staff of the evaluated field has been involved in a sufficient number of scientific projects, but, for the most cases, these projects are applicable to other fields of science - most often in logistics.

4.2

The research activities of TTI is channeled predominantly through the academic staff. Based on the visit, it was visible that effort has been put into forming laboratories that aid the scientific environment for research especially in the fields of robotics which is one of the focus fields relevant to aviation. Several courses such as Development of Sustainable Aviation (2CP) has been developed following the association in a project. There have also been instances where research platforms with international partners and cooperation thereafter lead to professor’s exchange visits which opened up avenues to organize seminars and guest lectures wherein researchers from various expertise exchanged knowledge.

4.3

There are a good number of organizations such as Keio University (Japan), The University of Thessaly (Greece), Otto-von-Guericke University of Magdeburg (Germany) with whom TTI maintains collaboration for both student and staff mobility as a result of which joint research projects and publications are achieved. The other benefits out of these collaborations include international vocational training schools, incoming/outcoming visiting researchers and professors, researcher training, supervision of PhD students and also support in postdoctoral proposals all of which are essential to maintain the quality of in-house research work. At the same time, international cooperation is recognized by TTI as an important direction for further development wherein their cooperation with the University of the West of England Bristol declares that the cooperation intensity should be good leverage for TTI to not only expand the possibility for research but also to increment international activities such as provide a double degree program thereby adding value to a preexisting course. However, interaction with the academic staff revealed that due to financial restrictions on the student's end, the opportunities are not utilized as much.

4.4

The academic staff of TTI not only are co-editors and members of the editorial boards of local and international journals and other publications but also some of them are experts of the Latvian Council of Science. Research is part of the job description for each academic staff and it is evaluated to mark their performance quality coefficient. There are various strategies such as remuneration policy issuing a separate payment for publication in renowned scientific journals and fee discounts for participation in conferences and many more to promote research culture among its staff. The scientific capacity of teaching staff enables them to prepare scientific articles, participate in conferences and workshops. Appendix 14 shows a list of scientific publications of the academic staff implementing the study field for the reference period. Articles are published in the Transport and Telecommunication journal which are included in some of the renowned databases such as SCOPUS, Web of Science (WoS), EBSCO Discovery Service, Google Scholar etc. It is worthy to be mentioned

that TTI has been organizing the international conference 'Reliability and Statistics in Transportation and Communications' (RelStat) for the past 20 years which is one of the main stage-openers for scientific presentations of students in the study field which was reiterated in the visit meetings while at TTI.

4.5

The involvement of students in aviation research is mostly through their participation in events related to innovation such as conferences, seminars and workshops. As mentioned previously, the students in the study field have an opportunity to participate in the conference ‘Reliability and Statistics in Transportation and Communication’ (RelStat) organized by TTI together with their supervisors. Student engagement in research activities is also encouraged by involving them in innovation projects with industry partners. One such project was the 'Industrial Research for the Development of a Firefighting Complex'(2019 -2020) in which students designed and modelled components and systems in a simulating environment based on the knowledge acquired from their study courses and so on. During the visit, it was visible that the students were not sure about the source to find a possible research collaboration even though the academic staff emphasized that instructions are provided during lectures which were found to be contradictory.

4.6

On the surface level, TTI incorporates innovation by offering distance learning, organizing summer schools and joint seminars through which students can participate remotely, benefit from the exposure to multi-phased culturally enhanced learning possibilities (project Spread Your Wings 2017-1-PL01-KA203-038782) and the honor to learn from the experts from the industry as well as the academic world. Working in projects is definitely one of the strengths of TTI and this is done through the Aviation Research Center, a sandbox for the development and testing of aviation units supervised by scientific experts. The involvement of partners such as Riga International Airport, Riga Technical University and D and D Center sets the ground for thorough applied scientific projects. There have also been efforts to weave in innovation through the development of a course considering the regulations and recommendations of the Latvian Civil Aviation Agency, European Union and the demands of the industry named ‘UAS/RPAS training’ which delves into the operation of unmanned systems which is the upcoming aviation revolution and currently on demand.

Conclusions. Strengths and weaknesses

Conclusions:

Scientific research is conducted successfully, results are integrated into the study programs, internationalization is achieved efficiently. Some risks may appear with the laboratory setup skewing a potential for a strong professional program.

Strengths:

1. Good research activities of the teaching staff connected with the industry.
2. APAC centre and state of the art laboratories.
3. The international involvement of the teaching staff is at a good level.
4. Holistic utilization of collaborations with organizations for the improvement of the study directive.

Weaknesses:

1. Lack of continuing education program in the study field
2.Most of the research work have been done in other scientific fields then Mechanics and Metal Processing, Heat Power Engineering, Heat Technology, and Mechanical Engineering
3. Potential to make use of the available laboratory setup for research activities.

5. Cooperation and Internationalisation

Analysis

5.1
With about twelve Erasmus+ collaborations and also partnerships and associations with universities and scientific institutions, industries and corporate companies, TTI strives to ensure that the study direction and its aims are compliant. The main criteria for forming new cooperation agreements are the possible improvements for TTI itself, the attraction of new students (both regional and/or international) and scientific research development. The engagement of the industry partners (also employers) are appreciated in the organization of study excursions, review of doctoral theses and consultation, the joint participation of academic staff and doctoral students in research, conferences and seminars, joint scientific publications and are also included in the Examination Commissions to the requirements of the industry. The internationalization strategy is developed and works in directions in EU and outside it, essentially involving an exchange between students, lecturers and experience as lecturers are acquired from cooperation with institutions and employers who also deliver guest lectures and also specific professional courses (by specialists of leading companies in the industry) such as Aviation Engine Construction (6 CP) in 2018/2019 was taught by the production manager of Airline Support Baltic and as students partake in projects such as Spread Your Wings. Cooperating with universities like Cranfield University contributes to the promotion of TTI by gaining access to top experts in aviation management who as a guest lecturer teaches the course to students at TTI. Based on the visit, the healthy cooperation was visible in the high engagement of the industry partners with their vast TTI graduate employees (from senior to apprenticeship level) who are actively looking out and interested in the developments introduced by TTI, are constantly on the discussion regarding updating according to the changing technology in the industry even though not much of industry research cooperation was assured.
5.2
The effective and well-implemented marketing policy involves mechanisms for acquiring new international students through service agents (M Square Business Solutions Inc.), PR activities in foreign markets regarding seminars for candidates and presentation in higher education exhibits, Digital advertising etc. to attract, select and recruit quality applicants from specified regions which contribute about 40% of international students in the study direction. Personnel is invited and introduced to TTI using its own resources in accordance with the Erasmus+ cooperation and other inter-university and industry cooperation agreements thereby the staff is well acquainted. If need be TTI announces recruitment on the European Commission's portal Euraxess to reach a larger audience.
5.3
The study program of Aviation Engineering includes internships in the amount of 10 CP to better the theoretical knowledge and practical skills required in the industry. There is an Internship Regulation stated by the TTI Regulations which clearly states the tasks of both sides, responsibilities and expected outcomes (Appendix 18.1) with partner companies such as Airline Support Baltic. To ensure the quality of the process, students submit a report briefing the work performed along with the logbook towards the end of the internship which is then evaluated by a differentiated test.
5.4
TTI plans on expanding the network of mobility partners and research by focusing on the partnership with the University of the West of England (UWE). Cooperation was concluded in the summer of 2020 and the program of Bachelor of Science in Computer Science has already been already taught but the initiative to develop a joint double degree program to be implemented for the year 2021-2022 and forward, which during the on-site visit the management also stressed that it is believed to attract larger flocks of local and international candidates and also strengthen scientific/academic collaborations.

Conclusions. Strengths and weaknesses

Overall, the cooperation implemented in TTI contributes to the specific features of the study direction and the programs within it. The cooperation with partners was found to be impressive and enhanced the possible achievements of the strategic goals and the learning outcomes defined by TTI in the study direction.

Strengths:
1. International lecturers/experts acquired from collaborations currently teach in TTI.
2. Cooperation with various entrepreneurs, organizations such as Airline Support Baltic, Riga International Airport and Regional enterprises gives a wide range of possibilities for the students.
3. Ongoing cooperation with Higher Educational Institutions through projects such as Erasmus+ and Spread Your Wings might be beneficial for attracting potential students.
4. Well-executed marketing strategy.
5. Healthy presence of TTI alumni in the Latvian aviation industry.

Weaknesses:
1. A unified channel/platform to interact with TTI Alumni, annual survey fulfilment among graduates is relatively low and thus there is an unused potential of Alumni involvement in the study direction quality assurance.
2. The collaboration with certain Universities and Organizations have not been utilized to its full potential

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

Analysis

The study programme was accredited by the decision of the Accreditation Commission of the Ministry of Education and Science of 19 December 2012 on study programs outside the study field and in accordance with the Cabinet of Ministers Regulations No.821 of 3 October 2006 Procedure for Accreditation of Higher Education Institutions, Colleges and Higher Education Programs. Later on, with the relevant decision of the Accreditation Commission of the Ministry of Education and Science of 31 January 2014, the study program Aviation Transport was included in the study direction Mechanics and Metalworking, Thermal Power Engineering, Heat Engineering and Machinery. (Annex 20). In the previous accreditation of the study direction, which took place in 2012, experts provided recommendations on the enhancement of the study direction, which is why TTI developed a plan for the implementation of expert recommendations.
Appendix 20. Execution of the plan for the implementation of expert recommendations.
Following the recommendations provided during accreditation:
1. Enhance the scientific and laboratory equipage of academicals education. Enhance the aviation professional preparation level of lecturer.
2. Enhance English language competence of students and academic staff by introducing subjects or modules taught in English.
3. Strengthen involvement of the representatives of stakeholders in the program management system
4. Establish opportunities and financial guarantees to continue studies in the case of closure of the program, its re-organization or other changes.
5. Establish real cooperation with the Institute of Aeronautics of Riga Technical University and aviation training institutions of neighboring countries.
1). Laboratories were established, their equipment was purchased and constantly improved and specially teaching aids were prepared for the acquisition of study courses included in the program (Airbus A320 Simulator, Airplane Cessna-152. Aircraft AN-2, Liquid Gas Systems, brake system,

landing gear retraction system and wing mechanization, anti-icing system, piston engine, laboratory laser cutting equipment), but scientific equipment corresponding to the sciences of field of study has not been purchased.
2). The academic staff independently improves their English language skills English courses (for 7 leading staff 175 ac.h in 2020). The first students were admitted to study in English in 2014/2015 academic year. Currently, the program teaches aviation English in depth, and individual training courses are taught only in English - Digital Technologies in Aviation.
3). Representatives of the aviation industry have been invited to teach the program, moreover the academic staff elected by TSI has done internships in industry companies - GK TA organizations employers are widely represented both in the Council of the Study Field and participate in various seminars, where the development of the study direction and program are discussed. Employers are represented on the Council: L.Odina -Chairman of the Board of Riga International Airport, V.Perekrestov - General Manager of S7 Technics, S.Shkolnik - Director of Base Maintenance at Magnetic MRO. Participants included specialists from aircraft maintenance organizations: GM Helicopters, RAF Avia, Airlines Support Baltic, Aviatest; Latvian Border Guard, Riga International Airport.
4). The cooperation agreement has been concluded with RTU on the continuation of student education at RTU (2012, and 18/05/2016) in case of closing the TTI study program.
5). Considering that there are only 3 higher education institutions in Latvia that implement study programs in the field of aviation - TSI, RTU, RAI, academic and scientific cooperation takes place between these higher education institutions. Foreign lecturers are involved in teaching the program, and the academic staff elected by TSI has increased their experience in ERASMUS + and other international cooperation programs. Academic staff of RTU and RAI are invited to teach courses at TTI.
Research cooperation - Annual scientific conference of Riga Aviation Forum, where highly qualified researchers from three higher education institutions - TTI, RTU, RAI – delivered their talks in 2020. The TTI is one of the partners of Aviation Research Center, whose type of activity is the provision of services for testing of aviation units and development of research infrastructure at Riga International Airport. Other partners include Riga International Airport, Riga Technical University and D and D Center and other companies (https://tsi.lv/about-us/partners/).
The implementation of the recommendations allowed increasing the quality of studies in the programs implemented in the study direction, at the same time, allowing starting full-fledged training of students in English.
During licensing process of the study program the experts formed the below recommendations (Annex 23):
1. It is necessary to strengthen the use of partner design/produce/maintenance organizations for scientific and research work using their modern equipment for composite materials, for cutting, producing and NDT (GM Helicopters, ASB).
2. In order to develop the bachelor program and achieve its goals, it is necessary to create an appropriate quality system, taking into account the strategic direction of the involved higher education institutions.
3. To assess the possibility to provide the program with the study courses of parts B and C in order to ensure student mobility possibilities.
TTI answered to all recommendations.

Conclusions. Strengths and weaknesses

According to SAR with annexes and information collected during the visit, it was visible that the TTI has taken into account the previous assessment visit recommendations and recommendations are implemented. TTI answered to recommendations referred to the bachelor study program and they

cannot be perceived as not fully implemented.

Strengths:
1. TTI responded to all recommendations received during the previous assessment procedures.
2. Actions based on recommendation enhance teaching and learning at TTI.

Weaknesses:
1. Scientific equipment corresponding to the sciences of field of study has not been purchased.

7. Assessment of the Requirements for the Study Field

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

Assessment of compliance: Fully compliant

HEI has developed internal quality assurance system which helps to maintain and improve study field. Self evaluation pages 45-47.

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

TTI have created and implemented different internal processes for example evaluating academic candidates, upgrading study course descriptions, motivating to do scientific research etc. Information obtained from site visit, internal process names can be found in annex No. 2, regarding study field management in self-evaluation table No. 9 and most important documents can be viewed on TTI website (https://tsi.lv/lv/par-mums/oficialie-dokumenti/).

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

TTI have created regulation "Management of Study Directions and Study Programs" on how to develop and approve study programmes. TTI also have study direction and study program management, which is responsible for periodic inspection of the field and study program. Self-assessment report page 36, and TTI website (https://tsi.lv/wp-content/uploads/2020/12/studiju-virzienu-un-studiju-programmu-nolikums-eng.pdf).

4 1.3. The criteria, conditions, and procedures for the evaluation of students' results, which enable reassurance of the achievement of the intended learning outcomes, have been developed and made public.

Assessment of compliance: Fully compliant

During the site visit students confirmed that they have been informed about evaluation criteria. Learning outcomes and type of final examination etc. is also publicly available for students. Documents can be obtained from TTI website (https://tsi.lv/sites/default/files/editor/Dokumenti/Oficialie_Dokumenti/gala_parbaudijuma_darba_vertesanas_noteikumi.pdf ; https://tsi.lv/sites/default/files/editor/Dokumenti/Oficialie_Dokumenti/plagiata_kontroles_noteiku

mi_0.pdf) and SAR Table 4. 1.3. point.

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

TTI have created "Regulations on Election to Academic Positions" to assure qualification of the academic staff. Work quality is assessed via surveys from students or via internal procedures. Under SAR 1.4. point in table 4. point. and TTI website (https://tsi.lv/wp-content/uploads/2020/12/nolikums-par-ak.-personala-ievelesanu-1.pdf).

6 1.5. The higher education institution/ college ensures the collection and analysis of the information on the study achievements of the students, employment of the graduates, satisfaction of the students with the study programme, efficiency of the work of the academic staff, the study funds available and the disbursements thereof, as well as the key performance indicators of the higher education institution/ college.

Assessment of compliance: Fully compliant

TTI ensures analysis and collection of student study achievements, satisfaction of the students with the study programme, efficiency of the academic staff (SAR pages 42-43; 76; 2.4. and 3.1 points), but during the site visit alumni could not confirm nor deny participation in surveys about their employment activities after graduation.

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

Assessment of compliance: Fully compliant

Different structural academic units are involved in provision of study process, TTI Senate also each year verify study direction self-assessment report, this way TTI senators get acquainted with study field performance. Nevertheless employer involvement in updating study process could not be confirmed during site visit and can be improved. Alumni participation in this process via surveys could not be confirmed during site visit. To establish stronger connection with graduates creating alumni association can be beneficial.

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

Assessment of compliance: Fully compliant

During the site visit experts team confirmed from different parties that TTI have contracts and agreements with organizations in Latvia and abroad, this engagement with industry, employers, other HEI ensures achievements of the aims of the study direction. Appendix 15. Cooperation Agreements and Appendix 19. Cooperation agreements on ensuring internship placement. It should be stated that students have raised desire to get additional experience in industry skills and hence extended opportunities for internship/apprentice implementation. Experts conclude that TTI can exploit even more collaborations with certain Universities and other partners in areas of scientific research and mobility.

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

Assessment of compliance: Partially compliant

During site visit experts confirmed that TTI have purchased aircraft samples, hydraulic system for exercises etc. These purchases for improvement of material-technical base seem rather

practically oriented and are used to improve practical skills of students rather than academical ones as this is academic study program. Most of research carried out in laboratories is in other fields such as: Electronics, Telecommunication (5G station for example) or Electrical Engineering (Robotics laboratory, than is in this particular field: Mechanics and Metal Processing, Heat Power Engineering, Heat Technology, and Mechanical Engineering. Currently students have no option to directly continue studies in Master level studies regarding engineering to ensure development of scientific creation on higher study levels.

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

Assessment of compliance: Fully compliant

Annex Nr. 20. Previous recommendations have been reviewed, implemented and fulfilled.

8. Recommendations for the Study Field

Short-term recommendations

1. Promote the use of scientific databases available in the TSI and ensure that in bachelors work references on papers available at TTI scientific databases are included

Long-term recommendations

2. Position of expenses: Costs to teaching materials, scientific infrastructure and other similar costs should be increased and we recommend to separate scientific infrastructure from all other costs in this position of expenses
3. Experts recommend to purchase scientific equipment in represented scientific fields of the study field to ensure appropriate material and technical provision required for the implementation of the study field with academic study programme
4. Consider making an agreement with the TSI Alumni Association about acquiring statistics from graduates.
5. Clarify the level at which each stakeholder (including non faculty staff of the university, recent graduates, professional organizations, employers) can - if willing to do so - intervene in the preparation of the quality plan. Report such an information in the published documents.
6. Strongly pursue the collection of feedback from students and recent graduates, looking at innovative techniques to have them cooperating in the effort (examples: request help form students' representatives, include a mandatory poll at the time of the application for dissertation, introduce polls with small prizes, like TTI-marked shirts). Feedback from "clients" is essential to improve the quality of the service offered. This action should be initiated as soon as possible.
7. To improve communication among major groups involved - StP director, StF director, TTI management, and particularly teaching staff
8. Assure more industry research cooperation
9. Consider to create a master's program corresponding to the bachelor's program in the study direction

10. To implement international scientific projects in the fields of science corresponding to the study direction
11. Purchase scientific equipment corresponding to the sciences of field of study

II. "Aviation Engineering" ASSESSMENT

II. "Aviation Engineering" ASSESSMENT

1. Indicators Describing the Study Programme

Analysis

The name of the academic bachelor study programme “Aviation Engineering “ (StP) meets the new label is intended to better match the current, international scenario of the jobs in the aviation field: the term engineering is easier to understand an will increase the appeal of the graduates in the job market. Limited changes are foreseen to the study plan, to be listed as the inclusion of courses about (i) Digital Technologies in Aviation and (ii) Engineering Modelling and Simulations that have a good, general fit to the new engineering flavour, as well as other new courses (Flight Management) and several smaller changes and adaptations, also in the number if credits. To be noticed that a course about remotely piloted vehicles, currently a hot topic, will be also added, increasing the appeal of the study plan.

The name of the StP has a logical connection to the content of the profession to be acquired and obligations for the alumni in the industry, as well as competence expected by employers.
Initially the degree name proposed by TSI to awarded was " Bachelor of Engineering in Aviation Transport " but in assessment visit TTI management and StP director agreed it should be changed to : " Bachelor Degree in Mechanical Engineering " corresponding to Latvian Cabinet of Ministers Regulations No 240 “Regulations on the State Academic Education Standard” (only Latvian).
The name and degree (Bachelor Degree in Mechanical Engineering) of StP corresponds to the code 43525 of the StP according to Latvian Education Classification (Latvian Cabinet of Ministers Regulations No. 322 “Regulations on the classification of education in Latvia” only in Latvian), meaning that first two digits `43` notes that the StP is academic bachelor program and the last three digits `525` notes the StP belongs to the program in “Mechanical Engineering (Motor Vehicles, Ships and Aircraft)”.
Consequently, the awarded degree corresponds to the StP's code and title.
Furthermore, the StP and corresponds to the Latvian Latvian Cabinet of Ministers Regulations No 240 “Regulations on the State Academic Education Standard” (only Latvian) and has provided the Compliance sheet of the StP with the State Education Standard (see StP Annex “0208 Atbilstiba izglitibas standartam.docx”).

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

The aims, objectives are strongly linked with content of the profession to be acquired and obligations for the alumni in the industry, as well as competence expected by employers. Knowledge applied to entire StP is very extensive.

The admission requirements are set centralized and corresponds fully to the legal requirements, are logical and efficient, and supplemented with the necessary legal internal documentation and forms.

Conclusions by specifying the strengths and weaknesses

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

Strengths
None

Weaknesses:
The current title of the degree does not comply with the requirements of regulatory enactments.

2. The Content of Studies and Implementation Thereof

Analysis

The aim of the implementation of the StP is to train highly qualified aviation engineering specialists, ensuring the development of a competitive career in the Latvian and international labor market.
The aim of the study field pertains to the TTI Strategy for 2020-2025 (https://tsi.lv/wp-content/uploads/2021/01/tsi-strategy_short_corr-21jan-lv_compressed.pdf), which advances the goal of “ensuring the provision of the StP offers that would meet the interests of the international target audience and reflect the strengths of TTI in computer science, transport, logistics and aviation, and be based on the current and future needs of the industry, which will impact the changes in business operations, business organization and society brought about by the 4th Industrial Revolution".
The StP structure is the following: Compulsory courses comprise 64 CP or 40.0% from the total amount of credit points, including 10 CP allocated to the Bachelor’s thesis. Limited elective courses include 80 CP or 50%, including specialization courses covering 34 CP or 21%. Free elective courses consist of 6 CP or 4.0%. The structure of the Bachelor's program complies with Cabinet Regulation No. 240 of May 13, 2014 on the National Standard for Academic Education (see Chapter II).
The substantive compliance of StP with the requirements of EASA Part-66 on theoretical modules required for obtaining aircraft maintenance licenses. While studying in the Bachelor's program, students have the opportunity to apply for a license for an aircraft maintenance specialist recognized in the European Union, which is clearly a measure of the quality of the StP.
Study implementation methods, assessment methods, types and requirements are included in the description of each study course, which is available to students in the e-learning environment Moodle. The study process is mainly implemented in the form of interactive lectures, seminars, practical classes and students' independent work. The study courses include practical classes, often including discussions, role-plays, team work and project work, solving specific professional performances or specific practical problems.
The choice of the method depends on the study results the teacher plans to achieve. The methods used are aimed at the development of the student's abilities: to learn, to use knowledge creatively, to cooperate, to evaluate oneself, to offer an alternative to solving problems, to think critically, to make a responsible decision. Each lecturer has a wide range of opportunities to improve their range of methods, but all methods require careful preparation and time-consuming. All study course teaching materials are placed in the e-learning environment Moodle. The basic principles and procedures of the StP acquisition evaluation comply with the requirements of Section 40 of the State

Academic Education Standard.
According to the regulations adopted by the TTI Senate, study results in the academic bachelor's StP are evaluated according to two evaluation criteria: quality criterion - a mark in the 10-point system and quantitative criterion - credit points according to the total number of hours in the study course. In the StP a complex method is used to evaluate the results of study courses. It includes an assessment of the results of students' practical work, individual or group work, mid-term examinations and final examinations (test or exam). In order to promote the permanent work of students, it is determined that the assessment of the final examination (test or exam) makes up no more than 50% of the final mark of the study course. At the beginning of the semester, students are informed how the final result (mark) will be determined. In practice, the assessment process takes place regularly throughout the studies. The final assessment of students' knowledge is posted at the end of the semester after all stages: practical work, seminars, independent work, between the test and exam results. The lecturer of each course has developed an evaluation methodology, where it is indicated what percentage of the total evaluation each evaluation criterion makes up. In the updated descriptions of study courses there is a general tendency to increase among the part of the examinations, which can be evaluated positively, because it allows the student to master the study material evenly and receive the assessment of the acquired knowledge. At the end of the bachelor's studies, the student chooses a topic of interest to him/her and in cooperation with a supervisor of his / her choice develops and defends the bachelor's thesis. TTI implements student-centered education to encourage students to be actively involved in the development of the study process and to ensure appropriate assessment of students' progress.

It is necessary to make sure that the real Latvian language knowledge corresponds to the presented one, because several lecturers with C1 level Latvian language knowledge in the descriptions of study courses in the section "Student's independent work" had a number of language errors. To the commission's request to show Latvian language proficiency certificates, the TTI management replied that they could not do so in order not to violate the personal data protection law.
At TTI Faculty of Engineering, student mobility is implemented in all study programs. Treaties concluded by TTI, which provide for a reciprocal flow of student exchanges at the faculty, see 5.1. Chapter.
Incoming mobility students are admitted to one of the study programs of the Faculty of Engineering as students during the exchange, although often exchange students choose to take separate courses from other faculty programs as well. Students are provided with the required amount of study courses and the appropriate number of credit points. The offered courses are implemented in English. The recognition of study results obtained during the ERASMUS + program is regulated by the TTI ERASMUS + program scholarship competition instructions (available at https://tsi.lv/wp-content/uploads/2021/02/erasmus-instukcija_compressed.pdf).
The number of students who choose to go on exchange mobility from the programs of the Faculty of Engineering is small. In the last six years, only 3 students of the study program “Aviation Engineering” have gone on exchange mobility (in practice), a total of 28 students from engineering programs in the reporting period, which is 17% of all TTI students who have used the mobility opportunity. The opportunity for mobility at the university is mostly chosen by the students of the social sciences program. There are several reasons for this:
• students of the engineering program start their work already during their studies;
• Prerequisites provided in each course are important for successful completion of the program, and it is not always possible to find similar courses at partner universities;
• It is important for students in the Aviation Engineering program to acquire the specific knowledge required for EASA Part-66 B1 or B2 specialists.
The number of incoming exchange students in the program has been significantly higher in the last six years - 25 students.

Annex 16 Inbound and outbound student mobility within the ERASMUS program.

Conclusions by specifying the strengths and weaknesses

Conclusion:
Overall, descriptions regarding all parts of the StP comply with the provisions set forth in the regulatory enactments. Study course descriptions compiles with the Law of Institutions of Higher Education (https://likumi.lv/ta/en/en/id/37967) Section 561, Paragraph two (See n.9 of section 5. Assessment of the Compliance of the StP in this report). Content is in line with learning outcomes and industry needs and trends but course planning and independent work should be improved. Study implementation methods are adequate and feedback from students taken into account although lack of motivation of students in answering surveys may fragilize the process. Good system regarding mobility processes but a decreasing number of students in mobility.

Strengths:
1. Competently compiled training program for the professional training of students in the specialty.
2. Extensive experience of teachers in this specialty.
3. A large number of specially equipped classes and laboratories for both full-time and distance learning of students.
4. Compliance of StP with the requirements of EASA Part-66 on theoretical modules required for obtaining aircraft maintenance licenses
5. A well-developed and functioning electronic control system for full-time and remote control of students' participation in the learning process.
6. A large number of contracts concluded with representatives of the aviation industry and research organizations (coverage up to 75%).
7. Great involvement of employers and regional stakeholders in the program design.
8. Good practices of student-centered learning policy.
9. A well-thought-out and developed distance learning system (e-learning environment Moodle) allows the student to conduct a step-by-step self-control of the material assimilation, which is especially valuable during a pandemic.
10. A well-established and equipped laboratories and modern simulators (A320, B737NG) for practical training of students.

Weaknesses:
1. Insufficient attention is paid to the ability to use text editors (Spell-checker, grammar) and the culture of document preparation at the beginning of student learning.
2. The academic and research part of the program is not sufficiently developed, the possibilities of partners to use their modern equipment (NDT, composite materials, electronic log-book using) are not visible in the graduation and research papers of students.
3. Difficulties in motivating students to answer surveys.
4. Insufficient tracking of the professional fate of graduates.
5. Several lecturers with C1 level Latvian language knowledge in the descriptions of study courses in the section "Student's independent work" has a number of language errors.

3. Resources and Provision of the Study Programme

Analysis

Due to the fact that there is only one StP in the study field, then the resources and provision of the StP coincide.

The study base, information base (including libraries), material and technical base and financial base correspond to the specifics of the StP. The scientific base in the respective field of study Mechanics and Metalworking, Thermal Power Engineering, Thermal Engineering and Mechanical Engineering can be assessed as weak. During the reporting period, a relatively large amount of equipment for practical classes has been purchased, but despite the recommendations expressed in the previous accreditation, scientific equipment corresponding to respective scientific fields has not been purchased.
Within the framework of the project "Modernization of STEM program of the Institute of Transport and Communications" the premises have been renovated, the provision of multimedia, study literature and databases, equipment, distance learning, etc. has been improved (2017-2020). Although TTI staff and students have access to databases such as Academic Complete, Elsevier, Scopus, their names could not be named by the academic staff, students or graduates, which indicates the poor use of this resource. The most electronic resources used by students are e-books and study materials placed in the TTI electronic system and library.

Conclusions by specifying the strengths and weaknesses

Conclusions
It would be excellent StP if it would be professional StP, because it has very good material and technical base as well there are many professionals from industry involved into realization of this StP, but for academic StP emphasis is on study fields corresponding scientific activities where right now StP is not that strong. TTI has very good cooperation with aviation industry. TTI don't use all possible benefits from getting realistic feedback from industry, students and graduates. As a result some ways of quality improvement of StPstays unused.

Strengths:
1. There is a good study base, information base (including libraries), material and technical base and financial base.
2. There is good cooperation with the industry, as a result of which the material and technical provision for students is provided even more completely.

Weaknesses:
1. Weak scientific base, in the scientific directions corresponding to the StP- in mechanics and metalworking, thermal energy, thermal engineering and mechanical engineering
2. Existing scientific databases are poorly used.

4. Teaching Staff

Analysis

4.1
TTI has ensured to maintain and improve the quality of the academic and teaching staff by implementing strategies for motivation systems which was very evident during the visit. There are no visible risks in the structure of the teaching staff – the staff has adequate competencies linked with the delivered courses (Annex 11 + CVs).
4.2
The StP has a stronger professional approach so there should be involved staff with some professional experience. More than 50% of the teaching staff has practical background linked with delivered courses and learning outcomes of the course (Annex 11 + CVs). During the visit, there were not identified any gaps in the composition of the teaching staff from the perspective of legal requirements. However, the spoken English language skills of some teaching staff did not match the

indicated level and may use some improvement. The research strength of the academic staff is the highest merit of TTI.
4.3
The conscious structuring of the study direction to be an academic StP also requires the staff to comply with constant staff development according to TTI Development Strategy for 2020-2025 which is also part of the job description and crucial for the assessment of performance. The academic staff have a good number of publications (Annex 13,14) which was ascertained during the visit.
4.4
The teaching staff is involved in research (SAR, Annex 13,14). The international contribution was found to be sufficient, including international staff mobility (SAR, Annex 12). The obtained information is used in the study process.
4.5
The mechanism for mutual collaboration between the teaching staff is coordinated through the Study Direction Councils (SDC), however, the process can be further streamlined to increase multidisciplinary collaborations thereby opening the StP with possible continuous education courses. Based on the visit, the collaboration between the teaching staff is at the relevant level.

Conclusions by specifying the strengths and weaknesses

Conclusions:
The qualification and research record of the teaching staff is in general on a satisfactory level. The mechanism of collaboration between the teaching staff and also on information flow between the director of the study direction and the teaching staff is good. Also, the international mobility of the teaching staff was found to be satisfactory.
Strengths:
1. Proper professional qualification and research record of the teaching staff.
2. Good collaboration between the teaching staff and StP director.
Weaknesses:
1. Intermediate English language skills of some of the teaching staff.
2. Inter-departmental communication may be streamlined.
3. It is necessary to make sure that the real Latvian language knowledge corresponds to the presented one, because several lecturers with C1 level Latvian language knowledge in the descriptions of study courses in the section "Student's independent work" had a number of language errors. To the commission's request to show Latvian language proficiency certificates, the TTI management replied that they could not do so in order not to violate the personal data protection law. There is a risk that certificates are obtained long time ago and language level has been decreased.

5. Assessment of the Compliance of the Study Programme "Aviation Engineering"

Requirements

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

Assessment of compliance: Partially compliant

31. appendix and appendix "Explanation about the Degree’s Compliance with the Republic of Latvia Education Classification Code 43525"
Degree name awarded should be changed to : "Bachelor Degree in Mechanical Engineering ".
During the site visit experts proposed to change awarded degree with accordance to rules of

Cabinet of Ministers, TTI agreed to change degree name.

2 2. Documents confirming that the higher education institution/ college will provide the students with the options to continue the acquisition of education in another study programme or at another higher education institution/ college (a contract with another accredited higher education institution/ college), in case the implementation of the study programme is discontinued.

Assessment of compliance: Fully compliant

22. appendix, contract with Riga Technical university (bachelor level program Aviation Transport).

3 3. Document confirming that the higher education institution/ college guarantees to the students a compensation for losses if the study programme is not accredited or the licence of the study programme is revoked due to the actions of the higher education institution/ college (actions or failure to act) and the student does not wish to continue the studies in another study programme.

Assessment of compliance: Fully compliant

27. appendix. Students will be compensated for the last semester, if student decides not to continue studies in any other StP.

4 4. The teaching staff members involved in the implementation of the study programme are proficient in the official language in accordance with the regulations on the level of the official language knowledge and the procedures for testing official language proficiency for performing professional duties and office duties.

Assessment of compliance: Fully compliant

21. appendix. There are international guest lecturers which does not apply to these requirements. It is necessary to make sure that the real Latvian language knowledge corresponds to the presented one, because several lecturers with C1 level Latvian language knowledge in the descriptions of study courses in the section "Student's independent work" had a number of language errors. To the commission's request to show Latvian language proficiency certificates, the TTI management replied that they could not do so in order not to violate the personal data protection law.

5 5. The teaching staff members to be involved in the implementation of the study programme have at least B2-level knowledge of a related foreign language, if the study programme or any part thereof is to be implemented in a foreign language.

Assessment of compliance: Fully compliant

30. appendix. Academic staff which does not comply to criteria is not involved in study process. However, the spoken English language skills of some teaching staff did not match the indicated level and may use some improvement. The research strength of the academic staff is the highest merit of TTI.

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

Assessment of compliance: Not relevant

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

Assessment of compliance: Fully compliant

29. appendix. In study process there are involved 6 professors and 4 associated professors.

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

Assessment of compliance: Fully compliant

After the site visit TTI clarified and corrected mistakes, now study agreement complies with the mandatory provisions to be included in the study agreement according to regulations of Cabinet of Ministers No 70 "
Mandatory provisions to be included in the study agreement". (22.10.2021 annex 1. Studiju līguma paraugs)

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

Assessment of compliance: Fully compliant

All study courses can be found in annex : "Descriptions of the study courses". They correspond with requirements of Higher education law. Nevertheless please update mandatory literature sources in study course descriptions, to improve the descriptions of study courses. Insufficient attention is paid to the ability to use text editors (Spell-checker, grammar) and the culture of document preparation.

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

Assessment of compliance: Not relevant

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

Assessment of compliance: Fully compliant

28. appendix. AIP letter added.

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

Assessment of compliance: Partially compliant

Appendix 23. All requirements are fulfilled except degree name and it should be changed to "Bachelor Degree in Mechanical Engineering". TTI agreed to change the name of the program.

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

Assessment of compliance: Not relevant

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

Assessment of compliance: Partially compliant

Most of elected academic staff possess publications in last 6 years. Annex 14 and Annex - Biographies of the teaching staff members. In these annexes publication could not be found for docent: Tatjana Šamšina. Last indicated publication for docent Maksims Smoļaņinovs is in 2015 which is borderline for this criteria.
Two of lectures (Aleksandrs Bulekovs and Jevgēnija Mikulko), who are added to list of academic staff members, but does not teach in English have not shown publication in past 6 years, theoretically, they also can not take part in study process.

15 R5 - Overall rating

Assessment of compliance: Partially compliant

Degree name should change in all documents accordance to Cabinet of Ministers. (Discussed with TTI administration during site visit.)

Requirements (R6-R8)

1 R6 - The compliance of the study provision, scientific support (if applicable), informative provision (including libraries), material and technical provision, and financial provision with the conditions for the implementation of the study programme and ensuring the achievement of the learning outcomes.

Assessment of compliance: Partially compliant

During the site visit experts team confirmed that students have possibility to participate in projects, begin scientific research. On premises there is accessible library with paper books and e-books, with databases and other information sources but they have to be promoted more among students. It must be taken into account since this is the only program in this direction and it is academic program, the allocation of 3% of all costs to teaching materials, scientific infrastructure and other similar costs (approximately EUR 6750 in 2020) is considered to be too low.

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

Assessment of compliance: Partially compliant

Most of elected academic staff possess publications in last 6 years (Annex 14 and Annex - Biographies of the teaching staff members), but some of them don't (see requirement 14). During the site visit Study department showed documents for evaluation of academic staff members. All visiting academic staff members are also evaluated by this procedure. After interviews with academic staff members experts concluded that overall English language level is sufficient but can be improved, need to continue to provide professional development projects regarding English language.

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

Assessment of compliance: Not relevant

Conclusions by specifying the strengths and weaknesses

Overall this StP complies with necessary requirements from law of higher education and rules of Cabinet of Ministers. Academic staff members also full-fill necessary requirements. TTI is on the right track to provide good quality studies for students in aviation engineering.

Strengths:
1. TTI provides projects for academic staff members to improve their language and lecturing skills.
2. TTI Administration is oriented on providing abundance of internships, traineeships for students, both locally and internationally.
3. TTI have bought and upgraded material-technical base to provide students with possibility to gain practical skills in aviation engineering.

Weaknesses:
1. Insufficient attention is paid to the ability to use text editors (Spell-checker, grammar) and the culture of document preparation at the beginning of student learning.
2.The academic and research part of the program is not sufficiently developed, the possibilities of partners to use their modern equipment (NDT, composite materials, electronic log-book using) are not visible in the graduation and research papers of students.
3. Insufficient use of modern simulators in educational practice (A320, B737NG) (some students did not use them in the educational process) (The possibility of using simulators for distance learning has not been demonstrated).
4. Difficulties in motivating students to answer surveys.
5. Insufficient tracking of the professional fate of graduates.
6. Several lecturers with C1 level Latvian language knowledge in the descriptions of study courses in the section "Student's independent work" has a number of language errors.
7. Weak scientific base, in the scientific directions corresponding to the StP- in mechanics and metalworking, thermal energy, thermal engineering and mechanical engineering
8. Existing scientific databases are poorly used.
9. Intermediate English language skills of some of the teaching staff.
10. Inter-departmental communication may be streamlined.
11. Degree name should be changed to comply with regulations of Cabinet of ministers.

Evaluation of the study programme "Aviation Engineering"

Evaluation of the study programme:

Good

6. Recommendations for the Study Programme "Aviation Engineering"

Short-term recommendations

1. Change degree name awarded to "Bachelor’s Degree in Mechanical Engineering" and make corrections in all related documents.
2. Please revise indicated academic staff member scientific activities for having publications in last 6 years.

Long-term recommendations

3. Continue to work on improvement of academic staff English language skills
4. Create unified template for study course descriptions to make them visually unified and captivating. For example: include unified font, font size, use one paragraph and line spacing through out the document, in literature section use one reference style etc. Update mandatory literature sources, include tests and laboratory works in syllabus outline table.
5. Purchase scientific equipment for scientific directions corresponding to the StP- in mechanics and metalworking, thermal energy, thermal engineering and mechanical engineering and attract more related scientific research projects
6. Promote the use of scientific databases available in the TSI and ensure that in bachelors work references on papers available at TTI scientific databases are included
7. Encourage projects/events involving both students and staff with other study groups in TTI which will pave the way for communication. Identify common topics with other study programs, teaching staff can be swapped or invited for a combined lecture. Also, with the change in technology, there might be possibilities for a collaborative development of new programs(for example: Information technology with Mechanics for a Robotics topic).
8.Consider defining the academic and research part of the program activities budget between study field, if possible, which could help to determine more precisely the return (financial performance) of each StP and study field.
9. Consistency of the Moodle e-learning environment could be improved by developing feed back for using simulators.
10. To improve course evaluations collection and analysis from students surveys, including ensuring the feedback to students` evaluations also formally posted online via e.g. Moodle. Consider legal aspects of the idea of not allowing students to register for next semester before course evaluations are done as it might contradict to the study agreement provisions and the objectivity of the course evaluations. Rather motivational than sanctioned push might be more efficient. Students themselves suggest filling the evaluation form during the last lecture of the respective course
11. Strengthen the tracking of the professional fate of graduates.

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

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

Assessment of the Requirements for the Study Field

Requirements	Requirement Evaluation			Comment
R1 - Pursuant to Section 5, Paragraph 21 of the Law on Institutions of Higher Education, the higher education institution/ college shall ensure continuous improvement, development, and efficient performance of the study direction whilst implementing their internal quality assurance systems:	Fully compliant			HEI has developed internal quality assurance system which helps to maintain and improve study field. Self evaluation pages 45-47.
R2 - The cooperation with different organisations from Latvia and abroad implemented within the study direction ensures the achievement of the aims of the study direction.	Fully compliant			During the site visit experts team confirmed from different parties that TTI have contracts and agreements with organizations in Latvia and abroad, this engagement with industry, employers, other HEI ensures achievements of the aims of the study direction. Appendix 15. Cooperation Agreements and Appendix 19. Cooperation agreements on ensuring internship placement. It should be stated that students have raised desire to get additional experience in industry skills and hence extended opportunities for internship/apprentice implementation. Experts conclude that TTI can exploit even more collaborations with certain Universities and other partners in areas of scientific research and mobility.

Requirements	Requirement Evaluation			Comment
R3 - Compliance of scientific research and artistic creation with the development level thereof (if applicable).		Partially compliant		During site visit experts confirmed that TTI have purchased aircraft samples, hydraulic system for exercises etc. These purchases for improvement of material-technical base seem rather practically oriented and are used to improve practical skills of students rather than academical ones as this is academic study program. Most of research carried out in laboratories is in other fields such as: Electronics, Telecommunication (5G station for example) or Electrical Engineering (Robotics laboratory, than is in this particular field: Mechanics and Metal Processing, Heat Power Engineering, Heat Technology, and Mechanical Engineering. Currently students have no option to directly continue studies in Master level studies regarding engineering to ensure development of scientific creation on higher study levels.
R4 - Elimination of the shortcomings and deficiencies identified during the previous assessment of the study direction, if it has been conducted, or the implementation of the provided recommendations.	Fully compliant			Annex Nr. 20. Previous recommendations have been reviewed, implemented and fulfilled.

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)

No.	Study programme	R5	R6	R7	R8	Evaluation of the study programme (excellent, good, average, poor)
1	Aviation Engineering (43525)	Partially compliant	Partially compliant	Partially compliant	Not relevant	Good

The Dissenting Opinions of the Experts

None.