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CENTRE FOR QUALITY ASSESSMENT IN HIGHER EDUCATION

EVALUATION REPORT

STUDY FIELD of AERONAUTICAL ENGINEERING

at Vilnius Gediminas Technical University

Expert panel:

1. **Prof. Dr. David Kennedy (panel chairperson),** *academic;*
2. **Prof. Dr. Giovanni B. Palmerini,** *academic;*
3. **Lect. Dr. Bassam Rakhshani,** *academic;*
4. **Lt Col Andrius Stuknys,** *representative of social partners;*
5. **Mr. Ramil Ahmadov,** *students' representative.*

Evaluation coordinator – *Dr. Domantas Markevičius*

Report language – English

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Study Field Data

Title of the study programme	*Avionics*	*Aviation Mechanics Engineering*	*Air Traffic Control*	*Aircraft Piloting*	*Aerospace Engineering*
State code	6121EX055	6121EX054	6011EX002	6011EX001	6211EX060
Type of studies	Full-time studies	Full-time studies	Full-time studies	Full-time studies	Full-time studies
Cycle of studies	First-cycle	First-cycle	Integrated studies	Integrated studies	Second-cycle
Mode of study and duration (in years)	4	4	5	5	2
Credit volume	240	240	300	300	120
Qualification degree and (or) professional qualification	Bachelor's Degree in Engineering Sciences	Bachelor's Degree in Engineering Sciences	Master's Degree in Engineering Sciences	Master's Degree in Engineering Sciences	Master's Degree in Engineering Sciences
Language of instruction	Lithuanian	Lithuanian English	Lithuanian English	Lithuanian English	Lithuanian English
Minimum education required	Secondary education	Secondary education	Secondary education	Secondary education	Bachelor's degree
Registration date of the study programme	14 April 2014	15 May 1997	16 November 2006	16 November 2006	15 May 1997

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I. INTRODUCTION

1.1. BACKGROUND OF THE EVALUATION PROCESS

The evaluation of study fields is based on the Methodology of External Evaluation of Study Fields approved by the Director of the Centre for Quality Assessment in Higher Education (hereafter – SKVC) 31 December 2019 Order No. V-149.

The evaluation is intended to help higher education institutions to constantly improve their study process and to inform the public about the quality of studies.

The evaluation process consists of the main following stages: *1) self-evaluation and self-evaluation report (SER) prepared by Higher Education Institution (HEI); 2) site visit of the expert panel to the HEI; 3) production of the external evaluation report (EER) by the expert panel and its publication; 4) follow-up activities.*

On the basis of this external evaluation report of the study field SKVC takes a decision to accredit the study field either for 7 years or for 3 years. If the field evaluation is negative then the study field is not accredited.

The study field and cycle are **accredited for 7 years** if all evaluation areas are evaluated as exceptional (5 points), very good (4 points) or good (3 points).

The study field and cycle are **accredited for 3 years** if one of the evaluation areas is evaluated as satisfactory (2 points).

The study field and cycle are **not accredited** if at least one of evaluation areas is evaluated as unsatisfactory (1 point).

1.2. EXPERT PANEL

The expert panel was assigned according to the Experts Selection Procedure as approved by the Director of Centre for Quality Assessment in Higher Education on 31 December 2019 Order No. V-149. The site visit to the HEI was conducted by the panel on 9th *November, 2022.*

Prof. Dr. David Kennedy (Panel Chairperson), *Head of Department of Mechanical Engineering, Technical University Dublin, Ireland;*
Prof. Dr. Giovanni B. Palmerini, *Professor of Navigation and Space Systems, School of Aeronautical Engineering, The Sapienza University of Rome, Italy;*
Lect. Dr. Bassam Rakhshani, *Lecturer of Mechanical and Aircraft Engineering, School of Engineering and Computing, University of the West of Scotland (UWS), United Kingdom;*
Lt Col Andrius Stuknys (social partner), *Commander of Air Force Armament and Equipment Repair Depot, Air Force of the Lithuanian Armed Forces, Lithuania;*
Mr. Ramil Ahmadov (students' representative), *part-time student of the second cycle study programme "Engineering Business Management" at the University of Warwick (UK), and Quality Manager, Quality Assurance Department, National Aviation Academy, Azerbaijan.*

1.3. GENERAL INFORMATION

The documentation submitted by the HEI follows the outline recommended by SKVC. Along with the self-evaluation report and annexes, the following additional documents have been provided by the HEI before, during and/or after the site visit:

No.	Name of the document
1.	Techninės priežiūros organizavimo vadovas

1.4. BACKGROUND OF AERONAUTICAL ENGINEERING FIELD STUDIES AT VILNIUS TECH

Vilnius Gediminas Technical University (VILNIUS TECH) is a state higher education institution.

VILNIUS TECH has 10 faculties, listed as: Environmental Engineering, Architecture, Electronics, Fundamental Sciences, Creative Industries, Mechanics, Civil Engineering, Transport Engineering, Business Management, and Antanas Gustaitis Aviation Institute. Also, there are 13 research institutes, 25 research laboratories, 5 research and training laboratories, 25 study-oriented laboratories and 2 practical training bases.

VILNIUS TECH is a predominantly engineering university. It offers 27 field study options, including: Engineering, Informatics, Mathematics, Technology, Social Sciences, Humanities, Business and Public Management, Arts. Within the fields of study there are 104 study programmes, 49 of which are first-cycle, 52 are second-cycle, and 3 are integrated study programmes. The university offers doctoral studies too that cover 12 fields of science.

VILNIUS TECH is involved in a number of partnerships with industry, research and strategic international projects. examples of such partnerships are listed below;

- Cooperation with SE Oro Navigacija, to provide air traffic control initial training
- Climate change research workshop partnership with; the European Air Traffic Control organisations GARS, DFS, FABEC, Baltic FAB and Oro Navigacija (Air Navigation), Climate Change and the Role of Air Traffic Control.
- International and national project partnership with industrial partners such as: JSC IT logika, and international universities; Scuola di Ingegneria Aerospaziale - Sapienza Università di Roma (Italy), BGU University (Israel) and the Centre for Research and Technology in Hellas (Greece).
- Industry partnership for students' internship; LLC FL Technics, the Lithuanian Air Force Base, Magnetic MRO Estonia, LLC Žvelk aukščiau, Vilnius Aeroclub, LLC Avion Express, LLC ELSA Technics, Jet Maintenance Solution, etc.
- International partnership with All4Jets from Poland to conduct EASA examination Part-147 organisation.
- ERASMUS international strategic partnership project ECOCORK, together with the partners from Turkey (ESKISEHIR OSMANGAZI UNIVERSITESI), Portugal
- Universidade de Aveiro and Amorim Cork Composites SA, Spain, Fundació Per a la Promocio del Sector Surer and Poland Politechnika Wroclawska
- Full membership of the international development network of aviation and aerospace technology engineering PEGASUS – a Partnership of a European Group of Aeronautics and Space Universities.

The study field of aerospace engineering – including the assessed/evaluated programmes – has been benchmarked previously in 2015. Moreover, evaluations on research activity (2013-2017), formal evaluation of research (artistic) activity (2018), evaluation of best final theses in the field for the period of 2015–2017, were pursued by the university.

II. GENERAL ASSESSMENT

Aeronautical Engineering study field and *first cycle* at VILNIUS TECH is given **positive** evaluation.

Study field and cycle assessment in points by evaluation areas

No.	Evaluation Area	Evaluation of an Area in points*
1.	Intended and achieved learning outcomes and curriculum	4
2.	Links between science (art) and studies	4
3.	Student admission and support	5
4.	Teaching and learning, student performance and graduate employment	4
5.	Teaching staff	4
6.	Learning facilities and resources	5
7.	Study quality management and public information	4
	Total:	

Aeronautical Engineering study field and *second cycle* at VILNIUS TECH is given **positive** evaluation.

Study field and cycle assessment in points by evaluation areas

No.	Evaluation Area	Evaluation of an Area in points*
1.	Intended and achieved learning outcomes and curriculum	4
2.	Links between science (art) and studies	4
3.	Student admission and support	5
4.	Teaching and learning, student performance and graduate employment	4
5.	Teaching staff	4
6.	Learning facilities and resources	5
7.	Study quality management and public information	4
	Total:	

Aeronautical Engineering study field and *integrated study cycle* at VILNIUS TECH is given **positive** evaluation.

Study field and cycle assessment in points by evaluation areas

No.	Evaluation Area	Evaluation of an Area in points*
1.	Intended and achieved learning outcomes and curriculum	4
2.	Links between science (art) and studies	4
3.	Student admission and support	5
4.	Teaching and learning, student performance and graduate employment	4
5.	Teaching staff	4
6.	Learning facilities and resources	5
7.	Study quality management and public information	4
	Total:	

*1 (unsatisfactory) - the area does not meet the minimum requirements, there are fundamental shortcomings that prevent the implementation of the field studies.
2 (satisfactory) - the area meets the minimum requirements, and there are fundamental shortcomings that need to be eliminated.
3 (good) - the area is being developed systematically, without any fundamental shortcomings.
4 (very good) - the area is evaluated very well in the national context and internationally, without any shortcomings;
5 (excellent) - the area is evaluated exceptionally well in the national context and internationally.

III. STUDY FIELD ANALYSIS

3.1. INTENDED AND ACHIEVED LEARNING OUTCOMES AND CURRICULUM

Study aims, outcomes and content shall be assessed in accordance with the following indicators:

3.1.1. Evaluation of the conformity of the aims and outcomes of the field and cycle study programmes to the needs of the society and/or the labour market (not applicable to HEIs operating in exile conditions)

Vilnius Gediminas Technical University (VILNIUS TECH) is a multi-campus University in Vilnius, offering a wide range of first and second academic programmes along with 5-year (300 Credit) integrated Masters programmes. For the programmes evaluated by the Expert Panel, facilities and infrastructure have received high financial support for development which was observed during visits to the dedicated Aerospace campus in Vilnius and Aircraft Hanger and piloting facilities (simulators, air traffic control systems and aircraft equipment). These places the University programmes in a strong position to cater for the needs of the Industry both in Lithuania and abroad for the foreseeable future. Staff qualifications and career activities are of a high standard in these programme disciplines, well supported by the Industry and Social Partners.

The Programmes of Study reviewed were as follows:

- Aviation Mechanics Engineering; 4-year Full-time Studies, First Cycle, 240 ECTS, Bachelor Degree in Engineering Science provided in Lithuanian and English language.
- Avionics; 4-year Full-time Studies, First Cycle, 240 ECTS, Bachelor Degree in Engineering Science, provided in Lithuanian language.
- Aerospace Engineering; 2-year Full-time Studies, Second Cycle, 120 ECTS, Masters Degree in Engineering Science, provided in Lithuanian and English language.
- Aircraft Piloting; 5-year Full-time, Integrated Studies, 300 ECTS, Masters Degree in Engineering Science, provided in Lithuanian and English language.
- Air Traffic Control; 5-year Full-time, Integrated Studies, 300 ECTS, Masters Degree in Engineering Science, provided in Lithuanian and English language.

Most of the programmes have been in existence for over 10 years and students from the various programmes share core and common modules together, providing a rich variety of multidisciplinary studies and activities.

According to the SER, the opportunity to acquire a profession related to Aircraft Maintenance, Aircraft Piloting or Air Traffic Control is offered by 17 organisations in Lithuania. 8 of these are involved in the initial training. A wider knowledge of Aeronautical Engineering is provided by 2 universities, and VILNIUS TECH in this case trains specialists in all basic areas of Aeronautical Engineering. Around 200 aviation specialists are trained in Lithuania each year, approximately 100 of which are trained by VILNIUS TECH. There is an indicated demand for up to 300 specialists in aviation each year according to the report. The study programmes on Aeronautical Engineering are designed to provide the students with knowledge and skills to work appropriately in the chosen field of Aeronautical Engineering.

The aims and outcomes of the programmes are as follows:

Aviation Mechanics Engineering: To provide specific knowledge of Aeronautical Engineering and enhance skills in solving complex objectives of aircraft maintenance and unmanned aerial vehicle development. This is achieved through technical and scientific knowledge, project work, conducting Research and working independently on tasks.

Avionics: Provides training and knowledge on Avionics and unmanned aerial vehicles via the use and learning of specific knowledge, analysis, designing and operating e-systems and equipment used in Aeronautical Engineering.

Aerospace Engineering; Provides interdisciplinary and up-to-date knowledge and skills in the field of aerospace engineering. Graduates are capable of undertaking Research, Design work along with the personal development skills to operate in a global aerospace engineering environment.

Aircraft Piloting; This programme offers aeronautical engineers a wide range of engineering knowledge and skills, Applied research, analysis, and a broad knowledge of aircraft mechanical, electrical and automatic systems.

Air Traffic Control: Provides Aeronautical Engineering specialists with a fundamental knowledge of science, engineering and management skills, capable of problem solving, analysing, researching, designing, evaluating and managing air traffic control-related processes.

The study programmes on Aircraft Piloting and Air Traffic Control are taught in English starting from the 2nd academic year. Some students gain international experience. Aviation Mechanics has been taught in English since 2020.

Based on the deliberations with the Management Team, Employers and Staff groups, it is evident that the Programmes are in demand by the national industries, including collaborations in the Aerospace (military aviation, SE Oro Navigacija, EUROCONTROL, Transport Competence Agency of Lithuania) programmes, that the aims and learning outcomes of the programmes are meeting the needs of Industry and society.

Full details on the aims and outcomes are presented in the VILNIUS TECH SER Annex report. This document shows a clear and comprehensive breakdown on programme content, module selection processes and how the overall Programme Outcomes are achieved. Details of career paths were discussed with the Teaching and Industry Groups and there is a strong demand for the graduates within the Industries listed in the SER report, indicating that the programmes are meeting the needs of Society, student cohorts and Industry. One observation worth considering by the University is to convert the Avionics and Aviation Mechanics Engineering programmes to 300 Credit Integrated programmes also which may reduce the duration from 6 years (First and second cycle) to 5 years and may offer a better appeal to students and the Industry looking for specialist skills and training.

3.1.2. Evaluation of the conformity of the field and cycle study programme aims and outcomes with the mission, objectives of activities and strategy of the HEI

As highlighted in the SER, the mission of the HEI is to train and develop a civically responsible, creative, enterprising, competitive personality receptive to science, latest aviation technologies and cultural values and to educate highly qualified experts in the field of Aeronautical Engineering. Strategically, the University is providing high quality education, research skills and focused training for students in the Aerospace programmes, to enable graduates to work and operate in the industries and undertake further learning to certification. This is evident by the range of practical equipment, physical resources, simulation equipment and piloting activities on site and the extensive links with Industry/ Social partners and Alumni the University staff lecturing on the programmes are engaged in high level research and business developments with Industry, meeting the strategic goals of the University. Campus development and infrastructure, especially in the Aircraft Mechanics and Aircraft Piloting, in line with the strategy and Engineering Faculty goals is growing due to investments. The First Cycle Bachelor awards and the Integrated Masters awards are in high demand for applicants from Lithuania and abroad. The programmes under evaluation have been offered by the University since 1997 and 2014 (1st Cycle), 2006 for the Integrated Masters and 1997 (2nd Cycle). This provides graduates with a wide opportunity of careers in the Aviation sector and engineering industries, which is in line with the Universities mission and Strategy.

As outlined in the SER, the university is strategic in meeting the needs of the industry and graduates and is competitive in the international domain.

The University Strategy is in line with the aims and learning outcomes of the programmes which include development of the international activities, study quality to meet international standards, Research and innovations, and sustainability.

This Mission and Strategy of the University are embedded in the Design and delivery of the First and Second cycle programmes under evaluation as observed by the visiting panel.

3.1.3. Evaluation of the compliance of the field and cycle study programme with legal requirements

Table 1. shows the ECTS credits dedicated to the first cycle programmes in Aviation Mechanics Engineering and Avionics.

Table 2. shows the ECTS credits dedicated to the second cycle programme in Aeronautical Engineering and

Table 3. shows the ECTS credits dedicated to the Integrated Studies programmes of Aircraft Piloting and Air Traffic Control.

Table 1. Study Programme's *[Aviation Mechanics Engineering and Avionics First Cycle]* compliance to general requirements for *first cycle study programmes*

Criteria	Legal requirements	In the Programme
Scope of the programme in ECTS	180, 210 or 240 ECTS	240
ECTS for the study field	No less than 120 ECTS	195
ECTS for studies specified by University or optional studies	No more than 120 ECTS	3 to 6
ECTS for internship	No less than 15 ECTS	15 to 18
ECTS for final thesis (project)	No less than 15 ECTS	15 to 18
Contact hours	No less than 20 % of learning	2325

Individual learning	No less than 30 % of learning	37%

Table 2. Study Programmes' ***[Aerospace Engineering]*** compliance to general requirements for *second cycle study programmes*

Criteria	Legal requirements	In the Programme
Scope of the programme in ECTS	90 or 120 ECTS	120
ECTS for the study field Information Services	No less than 60 ECTS	75
ECTS for studies specified by University or optional studies	No more than 30 ECTS	15
ECTS for final thesis (project)	No less than 30 ECTS	30
Contact hours	No less than 10 % of learning	18%
Individual learning	No less than 50 % of learning	585

Table 3. Study Programmes' ***[Aircraft Piloting and Air Traffic Control]*** compliance to general requirements for Integrated studies

Criteria	Legal requirements	In the Programme
Scope of the programme in ECTS	300 ECTS	300
ECTS for the study field Information Services	No less than 180 ECTS	192
ECTS for studies specified by University or optional studies	No more than 100 ECTS	3

ECTS for final thesis (project)	No less than 30 ECTS	30
Contact hours	Greater than 30%	3042
Internships	15	24

The first cycle of studies (Aviation Mechanics Engineering and Avionics) consists of 4 years Full-time and 240 ECTS. 195 ECTS contribute directly to the field of studies and project thesis (15 to 18 credits). These credits are within the legal requirements of the programme as shown in Table 1.

For the second cycle of studies (Aerospace Engineering) consisting of 2 years Full-time, 120 ECTS, 75 credits is allocated to the field studies, 15 to 18 credits for the final degree project etc as outlined in the SER report and Table 2. The full suite of ECTS credits are in line with the legal requirements.

For the Integrated study programmes of Aircraft Piloting and Air Traffic Control, as shown Table 3., the ECTS for the five-year programmes is 300 ECTS with a high content of credits for the field of study and thesis as expected within these focused programmes and meet the legal requirements.

3.1.4. Evaluation of compatibility of aims, learning outcomes, teaching/learning and assessment methods of the field and cycle study programmes

Study field of Aeronautical Engineering at VILNIUS TECH comprises five programmes: Aviation Mechanics Engineering, Avionics, Aerospace Engineering, Aircraft Piloting, and Air Traffic Control. Two of which are first cycle (Aviation Mechanics, and Avionics), one is a second cycle programme (MSc Aerospace Engineering), and two are integrated second cycle study programmes (Aircraft Piloting and Air Traffic Control). The common aim of the study field as stated in SER, section 1.2, is to provide specialists in aviation-aircraft related fields. The specialities range from aircraft maintenance engineering and design of UAV and satellite systems up to aircraft piloting and air traffic control. The structure of each study programme is presented in annexes: 1.1, 2.1, 3.1, 4.1, and 5.1. Modules are split into five categories: general modules, main, fundamental worldview, modules in other fields of studies, and study field specialisation modules. The general category modules are shared amongst all five programmes, in which students from all programmes study them. Although this is an efficient approach to utilise resources, but in some cases it may compromise the objectivity of the study programme to some extent. The module of mechanics, molecular physics, and thermodynamics is shared across the study field, as such the panel believes that such a module for

air traffic control may not fit with the purpose/objectives of the study programme. Nonetheless, most modules are well integrated into the programmes of study, and very clear and detailed information is given on the credit size, number of hours and methods of delivery (relevant annexes). The learning outcomes of each of the programmes are defined and linked to the relevant and intended modules of study, and methods of assessments. All of which are of HEI standard study structure and practices. VILNIUS TECH (AGAI) stated that its aviation and avionics programmes are in compliance with EASA part 66 requirements, therefore the syllabus of EASA contents seems to be integrated into the programme study modules. Although annexes 1.2 and 2.2 illustrate the relevant EASA contents linked to the modules, but, it is still unclear to what extent the EASA-66 syllabus is integrated into the assigned modules. The number of hours considered for the EASA content delivery needs to be clarified, and also if there is a specific method to assess the EASA-66 related learning outcomes should have been made clear and explicit. It is recommended that a clearer description and guidance is provided (to students) on the format of integration, delivery and assessment of the EASA learning outcomes. The panel believes that the programmes study plans, methods of delivery and assessment, laboratory and workshop activities are well in place for the delivery of the field contents. One of the main advantages of the study field at VILNIUS TECH (AGAI), is the availability of specialised laboratory and workshop facilities. These include: hangar facility for aircraft maintenance training, specialised laboratory facilities for aerodynamics, UAV and satellite design, also a fully certified flight and air-traffic control simulators. Although these facilities are part of the requirements for the delivery of licensed courses (piloting, air traffic control), they certainly play a significant role in advancing effective teaching and learning activities, compliance with the study cycles and more importantly attainment of the intended knowledge and skills by students. The panel strongly supports the way this study field is structured, laid out and resourced.

3.1.5. Evaluation of the totality of the field and cycle study programme subjects/modules, which ensures consistent development of competences of students

The structure of the study field across all five programmes are unique in the sense that all programmes within the field are sharing modules and resources, apply interdisciplinarity to curricular activities (project, research, industry, etc.), and provide opportunities to students to cross over other programmes (under certain conditions), and develop knowledge and skills in the field of study reconciled with the study cycles. Annexes 1.2, 2.2, 3.2, 4.2, 5.2 demonstrate the link between the study modules and expected learning outcomes. The selection of the module titles and their contents (for the programmes) are based on academics' expertise in the given field ensuring a comprehensive and consistent development of students' competencies (SER, section 1.5). As

evidenced by the panel during the meeting with academic staff, it is quite clear that there are significant and various levels of expertise exist in the study field, and that such expertise is well implemented and employed in the teaching and learning process. The methods for assessment outlined in the annexes comprise a range of HEI standard assessment formats, that ensures an effective and consistent assessment of learning outcomes. During the meeting with student representations, the panel understood that the programmes offer a fairly well-balanced teaching and learning work load, volume of assessments and ample opportunity to engage with curricular activities, such as: read/review research papers, engage with groupworks, develop hands on skills (engineering software, workshop/hangar practical activities), and develop the required competencies. It is evident, therefore, that the study programmes do offer and ensure consistent development of skills, and students' performance evidently confirm such skills development. Social/industry partners have expressed their satisfaction with the level of knowledge and skills developed and exhibited by students during internship/employment – a clear cut testimony of the effectiveness of VGTU (AGAI) study programmes.

3.1.6. Evaluation of opportunities for students to personalise the structure of field study programmes according to their personal learning objectives and intended learning outcomes

VILNIUS TECH offers a variety of flexible methods to increase study availability, running classes in the second half of the day is one example of such flexibility to consider students' personal circumstances (employed). All programmes of the field study include alternative (elective) modules that students can choose from a given list. Students are allowed to study on an individual study plan in order to earn credits for their second cycle study. Also, students can engage with their study online (remotely) and by use of e-study tools. In the final year of the programmes students can choose the topic of their final year project and/or choose to work with industry partners. Other provisions for personalisation of study include: choose and involve with mobility programmes; sign up to voluntary internship. Students can change their programme of study if they meet the conditions and also make a choice for a career pathway. As evidenced by the panel (during the meeting with student representations), there were examples of students who progressed from first cycle study onto second and up to PhD working with employer on the basis of research conducted in VILNIUS TECH (AGAI) – a very positive example of personalised opportunity made available to students to advance their study, alongside their career. The panel has found the provision of study personalisation in line with the objectivity of teaching and learning outcome attainment.

3.1.7. Evaluation of compliance of final theses with the field and cycle requirements

Given the availability of the expertise by academic staff, research laboratories, and engineering workshops, it is evident that the type and extent of final year projects/theses are largely related to ongoing research and technology development. The list of final year project titles presented in Annex 6, includes aircraft modification, the design of autonomous aircrafts and their systems, integration into the shared airspace, airspace simulation and aircraft flow distribution to reduce emissions and air traffic controller workload – all of which comply with the required study cycle criteria. Moreover, the project samples reviewed by the panel have been found to be of adequate quality to the level of study cycle/programme. The projects contained a good amount of numerical analysis, simulation data, and design product. As stated in SER, section 1.7, 16% of the final year theses were related to industry – a positive evidence of engineering collaboration between VGTU (AGAI) and industry/business.

The learning outcomes relevant to the final year project/thesis, are shown on programmes annexes. The learning outcomes linked to the thesis for the Aviation Mechanics programme (first cycle), does not include the research skills (GT), only IVG skills are checked. It is recommended therefore, to consider the research skills alignment with the final year thesis for the first cycle study field.

There is a provision of a financial award to final year projects that are based on practical task and/or prototype design and production. The panel has found this initiative as a strong support and motivation to enhance the quality of the project and ultimately the obtained knowledge and skills.

Final year projects are assessed by a commission of recognised experts, including research staff, professional members, social partner, and external assessor from another institution. The panel believes that the format of the assessment is fairly rigorous and integral to the study process, in which students are awarded the degree based on impartially and consistently made decisions. The panel does not see any gap in the compliance of the final year theses.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. Efficient utilisation of resources for the delivery of study filed programmes (5 programmes)
2. Purpose-made facilities for licence courses/training

(2) Weaknesses:

1. Integration of EASA part 66 content into learning outcome lacks clarity

2. Fairly high rate of on-time study non-completion

3.2. LINKS BETWEEN SCIENCE (ART) AND STUDIES

Links between science (art) and study activities shall be assessed in accordance with the following indicators:

3.2.1. Evaluation of the sufficiency of the science (applied science, art) activities implemented by the HEI for the field of research (art) related to the field of study

The VILNIUS TECH is involved in many typical applied sciences' activities in the field of Aeronautical Engineering in programmes funded and supported by local and national firms and institutions and in international cooperations as well as, moving to more advanced topics, in high quality EU-funded programmes (like H2020) or competitive tenders from European Space Agency.

As a result, there is a large availability of ideas, problems and examples from real-world applications for all the programmes assessed, and this challenging environment is naturally extended to the study curriculum and to the students in general.

Teaching staff looks extremely interested to promote research programmes, not only the ones more concerned with aeronautics but also the interdisciplinary ones, looking at commonalities among different fields. It is especially the case for remote sensing applications, optoelectronics, artificial intelligence, advanced and composite materials technologies. To be noticed that teaching staff is especially involved in transferring results from the aviation field to the society interests at large, which is a quite modern approach.

3.2.2. Evaluation of the link between the content of studies and the latest developments in science, art and technology

Following university's and especially institute's overall efforts in internalisation, researchers are active in several international programmes, enabling them to catch current state-of-the-art.

Teachers are quite experienced in the field. There is attention to current aerospace field challenges (examples given by drones and small spacecraft).

Social partners do confirm that preparation of the students coming from VILNIUS TECH do match their requirements, and this is valid during their university curriculum (namely during internship)

as well as after the university as graduates. Interestingly, it is especially true for some institutional or institutional-like players (as Armed Forces, National Air Traffic Control Agency or Regulatory Authorities).

Moreover, according to social partners, VILNIUS TECH courses provide a quite good understanding of the "aeronautic world" and prepare the graduates for the workers' market entrance, allowing them to select their own path. Overall, social partners agree that the degree helps in terms of critical thinking. The Faculty should raise the profile of R&D by stressing the publishing activity – in terms of number and venue of publication – of the staff

3.2.3. Evaluation of conditions for students to get involved in scientific (applied science, art) activities consistent with their study cycle

At VILNIUS TECH motivated students do have access to labs and to the maintenance shop at the airport to improve their preparation. They participate in research projects, and in later years they have chances to cooperate with teachers in research. Notice that the involvement of students is a plus for research projects funded by Lithuanian Council of Sciences, and that possibility, well known and exploited by the staff, helps in creating opportunities.

Master students participate in national conferences, and there is the chance to publish papers. Students can participate in initiatives as hackathons and ESA (European Space Agency) internships.

Quite recently, the Vilnius Tech Antanas Gustaitis' aviation institute has been accepted as a full member of the PEGASUS network among the European Universities active in the field of Aeronautics. However, the general scientific knowledge seems a bit neglected with respect to specialised, more professional skills relevant to the field of Aerospace Engineering.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. Motivated staff, with significant research programmes, certainly promising in terms of future research results' quality.
2. The continuous improvement in the quality of the study programme is proven by the recent inclusion of VGTU in the Pegasus alliance among the more important European universities operating in the aeronautical field.
3. A serious development plan is enacted, taking into account previous accreditation's suggestions.

(2) Weaknesses:

1. Bibliographic indexes could be definitely improved by stressing the publishing activity – in terms of number and venue of publication – of the staff.
2. With respect to the approach common to large universities and typically pursued in long study cycles, the general scientific knowledge seems a bit neglected with respect to specialised, more professional skills relevant to the field of Aerospace Engineering.

3.3. STUDENT ADMISSION AND SUPPORT

Student admission and support shall be evaluated according to the following indicators:

3.3.1. Evaluation of the suitability and publicity of student selection and admission criteria and process

The detailed information about the admission requirements and applicable conditions are available on the website of VILNIUS TECH. The enrolment procedures for the first and second cycle programmes follow the applicable rules and regulations of the Ministry of Education, Science and Sport of the Republic of Lithuania, VILNIUS TECH admission process and the other related admission processes. Due to the nature of the Aircraft Piloting degree, the specific admission requirements, namely physical fitness and other specific tests are required and this information is available on the website as well. It should be noted that along with the admission and enrollment information, the website provides information regarding the career prospects and opportunities, which help students to get a clear idea about their future after the degree. In addition, VILNIUS TECH puts well organised effort towards the popularisation and advert via the social platforms, events, and activities (Open Days, Drone Festival and etc) which motivates the schoolchildren to apply to the VILNIUS TECH, and the first cycle degree students to apply to MSc degrees. Based on the information provided by the students, the admission information is well described, easy to understand and satisfies the current students and other stakeholders of the VILNIUS TECH.

3.3.2. Evaluation of the procedure of recognition of foreign qualifications, partial studies and prior non-formal and informal learning and its application

The recognition of the foreign higher education institution certificates, education and learning outcomes, crediting the internship in Lithuanian and the foreign companies are in place and the related information could be found on the website of VILNIUS TECH. Students from the foreign countries are supported by the ISC. Also, from the 2020-year VILNIUS TECH enables entrants to

individualise their studies, where the competencies achieved are assessed non formally and informally in accordance with the VILNIUS TECH procedure (Description of the Procedure for the Assessment and Recognition of the Competencies Acquired through Informal and Self-Directed Learning). The maximum amount of credits that could be awarded is 70%. Thanks to the interdisciplinary nature of the degrees and Aviation industry, there are a wide range of possibilities to VILNIUS TECH to provide opportunities for the students with non-aviation degree to continue with MSc degree. Students can join specialisation in Aviation Process Engineering under the study programme in Air Traffic Control, whereas the competencies and experience gained in informal ways enables them to adapt to the content of the curriculum individually to everyone.

3.3.3. Evaluation of conditions for ensuring academic mobility of students

VILNIUS TECH international network, business partnership with several universities from Europe and Asia (China) are one of the main boosters to attract the international students and enable the Lithuanian students to continue their education abroad for all programmes. In addition, Erasmus+ financially enables the students, as well as the academic staff to benefit from external collaborations. In accordance with the information given in SER (3.3, page 33) the selection of the students for the programmes are organised twice a year. The same information, including the detailed information about the Erasmus+, is available on the website of the VILNIUS TECH. During the meeting with the panel, students confirmed their awareness of the programme. During the meeting with students, the shared experiences about attendance in Erasmus programmes were positive and the gained credits accounted for and taken into account.

The efforts employed by the university to attract international students and VILNIUS TECH students to study in leading European universities are to be commended, which is evidenced by data given on SER part 3.3 (Refer tables 7 and 8, Figure 10). The projects that could be noted as an efficient result of the strategic approach of the university to international collaboration are ECOCORK and PEGASUS: All the members of the University can get the benefit from these projects by collaborations.

3.3.4. Assessment of the suitability, adequacy and effectiveness of the academic, financial, social, psychological and personal support provided to the students of the field

Financial, academic, and psychological support provided to the students by the VILNIUS TECH are well organised and managed in a systematic way. The financial support, namely the incentive scholarship, is not only the financial support but also a great and effective motivation for the students that positively impacts their involvement, engagement, and performance. The university financial

support (one time targeted) is also available for those students who have notable results in sports, art, science, social activities popularising and publicising the name of the University. In addition, this scholarship could be provided for the students attending/participating in international and/or national scientific conferences, seminars, Olympiads, etc.

The teaching approach employed and the learning styles of the students based on the group work presentation are very beneficial for the students in terms of integration to real-life industry related tasks, effective teamwork, communication, and leadership skills. In addition, the peer assessment during the team projects helps students develop lifelong skills in assessing and providing feedback to others, and equips them with skills to self-assess and improve their own work.

The instructors and academic staff support are in place. Students are encouraged to suggest interesting/innovative ideas and work on these ideas as project/thesis which also helps motivate students to continue second and third cycle degrees, as well as expanding and deepening their knowledge. Students feel well supported, and the culture and conditions created within the university make them feel comfortable to ask for help during the difficulties and issues whether it is directly linked to the study/education or other matters.

3.3.5 Evaluation of the sufficiency of study information and student counselling

During the meeting with students, very positive feedback was received regarding the facilities, access to the labs and maintenance workshops, computer rooms, software, access to Aerodrome, ATC simulator etc. All provided resources enable students to apply the gained theoretical knowledge into the practice.

Students have the opportunity to meet with the lecturers or professors face-to-face and discuss homework, thesis works and other academic issues. When a student feels some difficulties to proceed on their own, he/she can easily get support from the university member (lecturers, class representative, dean and other person). Students highlighted that they are satisfied with the level of support, and lecturers' competence and helpfulness.

It should be highlighted that students are also satisfied with the structure of the programmes where the theoretical and practical parts are well balanced. Workload during the study is well organised and is manageable.

In addition, students have access to research projects, and they can apply for the research "project" scholarship as well, mainly for Aerospace, Aeronautical Engineering, and UAV projects.

Given the nature of the degrees, students receive comprehensive safety briefings during the practical training/laboratory works.

Students are aware of their career prospects and the study outcome. And have robust and sound knowledge about the selected study programme.

Strengths of this evaluation area:

1. Focusing well on practical part of the study
2. Strong and well-established connections with the industry and European universities
3. Broad, interdisciplinary and deep knowledge of the subjects and modules

Weaknesses of this evaluation area:

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3.4. TEACHING AND LEARNING, STUDENT PERFORMANCE AND GRADUATE EMPLOYMENT

Studying, student performance and graduate employment shall be evaluated according to the following indicators:

3.4.1. Evaluation of the teaching and learning process that enables to take into account the needs of the students and enable them to achieve the intended learning outcomes

The study field teaching and learning comprise of the standard theory part and the practical modules. The facilities at AGAI as were toured by the panel, have been found to be of high standard, classrooms and lecture theatres for theory sessions, and practical sessions are held in highly-resourced laboratories, workshops, simulators, and hangars. The practical nature of the professions in Aeronautical Engineering – in particular the types of courses offered at AIGAI (Aircraft Maintenance, Pilot, Air-traffic Controller) requires significant consideration on practical education and training. The information presented in the SER to a large extent does indicate the significance, importance and necessity of the practical activities in the forms of internship, simulation and flying hours, and maintenance training etc. And in order to meet the licensing criteria (EASA, CAA, ATCO), the certain types of training and their hour numbers are well maintained by AGAI, given that facilities are all in house. The licensing theoretical contents are integrated into the main programmes study plan and structure. As it is evident from SER, that AGAI is not an EASA approved organisation for maintenance

engineering, as such it is expected that some students would not pursue the licensing route. It is recommended that clearer career pathways with indicated learning outcomes are established.

The panel has found the practical and training elements of the programmes strong and almost fully reconcile to the licensing requirements and intended university learning outcomes. AGAI demonstrated a consistent approach to embed ample workshop-based activities, in-house simulations and flying, and maintenance practices in the structure of the delivered programmes. This aside, there are plentiful examples witnessed by the panel of theory-based activities in the form of: problem solving, computer-based engineering design and simulations, numerical analysis, etc. that conform to the intended university degree learning outcomes requirements. The panel is of the view that there is no significant gap in the teaching and learning process when it comes to the practical and training modules and learning outcomes.

3.4.2. Evaluation of conditions ensuring access to study for socially vulnerable groups and students with special needs

The measures observed by VILNIUS TECH to ensure integrity and access of education to students with special needs are fully described in SER, section 4.2. A student disability services coordinator is assigned to provide assistance to students with special needs and liaise with academic staff. The teaching and learning is adapted to the needs and condition of the students. Students can attempt exams online, extend/postpone internships, etc.

Also, students with special needs are eligible for scholarship and/or tuition fee waiver.

Students' needs and conditions are assessed via procedures described in the university weblink accessible to students. The results of such assessment, informed measures will be taken by academic staff to assist students with their academic learning and responsibilities. They will be provided with additional resources and time to complete their learning, assessment etc.

The panel hasn’t had any opportunity to meet with vulnerable group representation, nor have had access to any form of teaching and learning and assessment materials for such groups. However, the measures and procedures taken by VILNIUS TECH are standard required provisions for special needs students to which HEIs have obligatory duties to fulfil. According to the description in SER on students with special needs, VILNIUS TECH is in full compliance with these requirements.

3.4.3. Evaluation of the systematic nature of the monitoring of student study progress and feedback to students to promote self-assessment and subsequent planning of study progress

The monitoring process of students at VILNIUS TECH – as described and demonstrated by the SER sections 4.3, and 4.4 – is performed for a number of aspects: monitoring student academic progress through assessment of attaining intended learning outcomes; monitoring and analysing the completion rate of the course and graduation; monitoring students' satisfaction; post-graduation destination; and monitoring and analysing student survey results. SER has referenced data on the monitored aspects of students' graduation, progression and satisfaction rates, all of which demonstrate the existence of a systematic approach to monitor students' study progress. The evaluation of the data (in SER) by the panel has indicated that there is an impartial approach taken by VILNIUS TECH to provide an honest account on all aspects of monitored information. It has been revealed that almost half of the students in first and second cycle studies do not complete their study on time, where integrated studies count for more than 60% of non-completion of study on time (SER, table 5, Fig 13). They either terminate (dropout) or postpone to a later time (it is understood for piloting studies some of the delays are due to the unavailability of flying conditions). It is vital for VILNIUS TECH (AGAI) to investigate the cause of such drop out and perhaps think of a student retention scheme to address the issue. The achievement of learning outcome is another aspect of the monitoring that aims to capture students' progression rate at given programmes. Fig. 14 from the SER shows the achieved level of learning outcomes across study programmes, where the achievement ranges from 63% up to 97.7% – very good results that certainly demonstrate the reflection of the quality of teaching and learning, and students' performance excellence.

Another system of monitoring is the feedback process that VILNIUS TECH (AGAI) provides at teaching and learning level (feedback on assessments, problem-solving, courseworks etc.), and at programme level. At programme level there are a number of systematic surveys conducted to gauge students' views/opinions on aspects of the programme quality; organisation and structure, academic staff, choice of study, mobility, careers, etc. All of these surveys are performed and recorded online using VILNIUS TECH ENG form of surveying. The panel has the view that the management at AGAI is seriously addressing shortfalls in the quality of the programmes. Surveys of social partners are also pursued to assess and reflect upon the quality of internship, industry projects, gauging opinions on career and employability. Data from the above surveys are presented, discussed and analysed in the SER, that demonstrate a strong motive for self-assessment and self-reflection. The panel believes that

the monitoring system is appropriate and may only need further and/or stronger reflection on the outcomes.

3.4.4. Evaluation of employability of graduates and graduate career tracking in the study field

Employment opportunities for the graduates of these programmes are quite successful with current demands higher than the supply. According to the SER, there is a demand for up to 300 specialists per year in these sectors. The Alumni successfully develop careers in the field of aviation or in other engineering companies in Lithuania, European Union and worldwide. Graduates commence their careers in aviation companies as trainees while studying and then as specialists with further training. During the meeting with the Alumni Group, for instance, indications were that some graduates received careers as Air Traffic Controllers and specialists in R&D. It was evident that the teaching staff were engaged with the Industry on a business and applied research level, leading to good collaborations and stronger links with the University, Alumni and undergraduate students, however, the R&D activities with Industry have an opportunity to grow and this should be developed further. Industry groups also indicated a need to accelerate the duration for certification/licensing for graduates of the programme and enhance the simulation software on offer within the modules along with more hands-on skills, such as machine shop activities. On balance, the programmes offer good practical and theoretical knowledge, providing good career paths to students on graduation.

The University is in close contact with the Alumni groups and conducts surveys with the Industry to ascertain career opportunities and future roles in the technologies and career paths. All students of the programmes experience Internships in industries, providing them with specific skills currently in demand. However, employer groups did emphasise the importance of matching the knowledge and skills learned to some careers in the industry that may require lower levels of academic abilities.

Statistics on graduate employment and range of careers were discussed and appear to be relevant to the requirements of the industry and employer needs.

Examination of the range of physical equipment, aircraft hangar, aircraft, simulation software and aircraft structures and kit for training also reinforces the employability of graduates.

The specialists trained by AGAI along with the quantity and quality of the services offered are rated quite high. As for the recently rated aviation training centres, AGAI has been positioned the 13th of 60 ranked educational institutions in Europe (24th of 186 rated educational institutions in the world

respectively), according to the SER report, which is to be highly commended and an endorsement of the Universities Mission Strategy and academic programmes.

3.4.5. Evaluation of the implementation of policies to ensure academic integrity, tolerance and non-discrimination

Within the University (SER Report) the principles, means and ethical provisions ensuring academic integrity, tolerance and non-discrimination are defined by The Code of Academic Ethics of VILNIUS TECH (2021), promoting a culture of quality in studies and research, acting in a socially responsible manner, fostering academic integrity, transparency and accountability in terms of stakeholders. From this, members of the academic community understand their mission and social responsibility in society and show the public that the University cares and acts on responsible professional behaviour.

In December 2021, an updated Code of Ethics was approved (Ombudsman for Academic Ethics and Procedures of the Republic of Lithuania). The new version of the document clarifies the cases of ethical violations in more detail covering a wide range of social responsibilities and issues.

Academic integrity is promoted in different forms by the University. First, it is governed by domestic legislation, regulations of studies (2020). The document calls for the basic provisions for academic integrity in the studying process. Chapter 8 of The Description of the Procedure for Student Performance Assessment and Earning Credits at Vilnius Gediminas Technical University (2018, 2019) identifies the cases that are considered unfair and the measures or sanctions applied in such cases.

Thesis are subjected to plagiarism checks via Turnitin tool, giving staff and students feedback on their work.

Gender Equality has been addressed by the University to help with ensuring equal opportunities for all current and future members of the University. Equal opportunities are valued and measures for promoting non-discrimination and equal opportunities implemented.

Based on the interviews with students and teaching staff, there is strong evidence that policies of good practice are in place to ensure academic integrity, tolerance and non-discrimination. Examples were provided of complaints being dealt with in a formal manner. Students have a voice on Academic Boards whereby they can raise issues of concern on a range of matters that may arise from academic

standards, quality of programmes, technical equipment and external activities such as work placements.

There is a well-defined practice ongoing at the University that allows teaching staff in particular to plan their workload for the following academic year. This may be in Research activities, Lecturing or a combination of both. This is then assessed and approved by the relevant management team.

3.4.6. Evaluation of the effectiveness of the application of procedures for the submission and examination of appeals and complaints regarding the study process within the field studies

Student Appeal reporting mechanisms are detailed in the SER Report (Page 53) and website. Document regulates the appeals of the students and applicants to the University considering performance of assessment, including the breaches of assessment procedures and how to submit and resolve student complaints. Appeals against the final theses and examinations taken under the supervision of boards as well as against assessment in line to aviation standards may be made only in the cases of the breaches of knowledge assessment procedures.

Surveys conducted by students provide the opportunity to evaluate lecturing staff and this information is assessed at University level and discussed openly in relevant Fora. It was evident that good practice in dealing with students in particular, identifying any weaknesses in the studies and supporting staff for further studies is evaluated and acted on by the University through their policies and procedures.

Students, teachers and the study programme committee can also meet to deal with programme and academic related issues. Students can appeal their grades and scores in these areas and are addressed by the Management Team.

Complaints made by students must be submitted within a suitable time frame and are addressed by the Management team or specially organised committee.

In cases where lecturing standards are not appropriate, new staff may be appointed to support the learning in areas where difficulties have arisen.

One opportunity to improve the examination process in particular would be to appoint an external examiner to review examination material, propose changes and ensure the integrity and standards of students' assessment work.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. The teaching and learning activities are strongly supported by well-equipped labs and workshops.
2. The practical content of the programmes seems to be of adequate quality and quantities for theoretical and skill consolidation
3. The career path for students who complete the study seems to be straightforward as a result of the link with industry utilised for training, internship, project and research collaboration

(2) Weaknesses:

1. Lack of external vetters/examiners to review examination materials across all study levels (years) (not only thesis)
2. Students drop out from the study

3.5. TEACHING STAFF

Study field teaching staff shall be evaluated in accordance with the following indicators:

3.5.1. Evaluation of the adequacy of the number, qualification and competence (scientific, didactic, professional) of teaching staff within a field study programme(s) at the HEI in order to achieve the learning outcomes

The study programmes involve a rich group of teachers with significant specific expertise. As highlighted during the on-site visit, the staff is seriously committed to the education of students, with a passionate approach to lectures as well as to assistance to students and tutoring in theses and lab activities. At the same time, instructors are convincingly involved in research projects. The ratio of research vs. teaching effort is defined on the basis of a yearly programming exercise, with a prior submission of individual staff plans and allowing for some flexibility in teaching assignments.

The qualification of the teaching staff can be considered good enough, even if better bibliography indexes (number of publications included in international databases) to be achieved by means of presentation in recognized international conferences and submission of papers to leading specialist archive journals should be convincingly pursued by all teachers.

It is interesting to positively remark that recommendations from previous accreditation exercises have been taken into account, with a claimed increase in the number of teachers and involvement of young doctors. In fact, the presence of young instructors helps in understanding the strong motivation and the mature involvement in the activities shown by the staff during on-site visits.

3.5.2. Evaluation of conditions for ensuring teaching staffs' academic mobility

Basically Erasmus+ has been cited as the only option for mobility in the Self-Evaluation Report, and no other different elements have been collected during the on-site visit. The selection of the candidates to mobility carried out as depicted in the report seems centralised, indeed original and a bit authoritative, even if it could be also a way to show that this aspect is considered and organised by the institution. Opportunities are there for both teaching and administrative staff, and they are published in the website (that does not actually look like not a large support from the university). Numbers of outgoing are reasonable, incoming visits are quite limited, but all numbers have to be considered in the frame of the recent pandemic emergency.

3.5.3. Evaluation of the conditions to improve the competences of the teaching staff

There is the claim of a strategic plan based mainly on the turnover of older teachers with younger ones obviously closer to modern technological issues. According to on-site visit, the plan has been duly implemented, with a significant difference from previous conditions.

The increasing opening to foreign institutions and even to European universities' alliances – like the recent admission to the Pegasus network joining leading European universities in the aerospace field – will certainly help.

A suggestion is to stress the publishing effort, to reach multiple goals: to gain awareness of the hot topics, to clearly expose staff to high standards in the field, to increase chances of cooperation. In such a frame, it is acknowledged that since last accreditation the University introduced a formal evaluation of the scientific outcome to be repeated every year, and a reward system based on key performance indicators (KPI), including number of papers among the evaluation areas.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. Teaching staff is really motivated and enthusiastic about working in this university and in this study programme.
2. Interesting research activities carried on well-equipped labs, promising interesting, international level outcomes in the short future.
3. Rich availability of traditional and more modern equipment, very helpful in teaching but at the same time useful to suggest research initiatives.

(2) Weaknesses:

1. Limited mobility of the teaching staff, to be more encouraged and supported by the institution.
2. The level of research outcome, yet really promising due to significant involvement of the young and motivated staff working in fields of interesting perspectives, is still limited.

3.6. LEARNING FACILITIES AND RESOURCES

Study field learning facilities and resources should be evaluated according to the following criteria:

3.6.1. Evaluation of the suitability and adequacy of the physical, informational and financial resources of the field studies to ensure an effective learning process

During the visit, it was found that VILNIUS TECH changed the principle of funding and separately approved AGAI's expenditure solely on the revenue generated by AGAI, thus ensuring the financial endurance of the main aeronautical programmes. This change also led to an increase in the overall budget of salaries of state-funded staff due to the augmentation in the number of students in the field of aeronautics engineering, supporting industry needs. Additional public investment in real estate acquisition was planned to meet the objectives, and all major aeronautics studies were transferred to the newly constructed premises on Linkmenų Street. VILNIUS TECH entirely reorganised flight training infrastructure, runways, and aprons, and a new aircraft maintenance hangar was built not only to familiarise students with aircraft service in theory but also to provide the necessary practical training. From 2022, the construction of new 800-square metres premises is planned to expand the Library and increase teaching classes.

Since 2021, many computer workplaces and computer classes have been renovated. In the study process, AGAI uses various types of software applications that can be installed directly on home computers. The University spent a total of 1.8 million euros on IT software, hardware, and services,

which amounted to €280,000 for hardware, EUR 841 000 for software, and EUR 678 thousand for other IT services. VILNIUS TECH invested more than EUR 16 million in developing the central University of studies to improve the infrastructure of the general course units and upgrade key laboratories (projects should be completed in 2023).

VILNIUS TECH is looking for innovative ways of organising studies to provide students with science-based knowledge, decision-based practices, and an opportunity to develop. Analysing the learning facilities and resources, students have the opportunity to build their own experience by participating in career-oriented study content search, business-driven research, and partnership-based practices. In this journey of knowledge, teachers became guides and advisors, helping students to know their strengths. Aeronautical study programmes are adequately organised, responding to the University's innovative position and potential for change in aviation. Particular attention is paid to developing digital, communication, industry, and leadership competencies. Students' "failures" are seen as a positive learning experience that enables re-expression and development.

During the visitation, it was verified that the theoretical training was carried out on the central premises of AGAI. The premises for academic lectures are suitable, fully equipped, and meet safety and hygiene standards. VILNIUS TECH currently has a sufficient quantity of research laboratories for studies. The University has installed a mobile version of the self-service portal "Mano.vilniustech.lt" to improve the study process. The Moodle system is a widely used virtual learning environment by lecturers to provide students with educational materials and organise individual or group work. The University widely uses Zoom for video conferencing software. Zoom licences are purchased to ensure unlimited video conferencing time for the more efficient online organisation of work online.

Publications on aviation science can also be found in the Open Foundation of the Central Library. All printed publications are lent to community members who will be used at home. The methodological resources of the study programmes are based on the funds of the VILNIUS TECH Library and electronic publications in databases. During the period 2017-2021, 111 new printed books on aviation sciences were purchased. The Joint Foundation of Aviation Sciences has nearly 7,000 books and periodicals.

During the visit to the Kyviškės aerodrome, the flight training base for aircraft pilot students has been assessed with the following primary aircraft: Cabri G2 helicopters (2 units), single-engine aircraft Cessna 152 (1pc) and Cessna 172 (1 unit) for initial training, Cessna 172s (3pc) instrumental training, Cessna 182T (1pc,) dual-engine aircraft Piper PA-34 Seneca (1pc). This infrastructure is regularly updated, and premises and rooms for students for theoretical lectures and practice are

provided. It is essential to mention that the condition of the aerodrome and aircraft is monitored and audited following EASA maintenance standards following the approved maintenance manual.

During the Aeronautics Engineering Practice Base examination, it was found that this infrastructure is well-prepared and suitable for the study programmes of Aviation Mechanics and Avionics. In the main premises, the aircraft maintenance hangar occupies a relatively large area of 800 m^2, where students are introduced to the maintenance and technical procedures using special tools. The hangar features different aircraft components and structures that serve as exemplary elements to help students understand various structural solutions, fasteners, and structural connections. The Aircraft Engine Laboratory provides different types of engines and their cuts so students can see and see the structures of various engines.

The air traffic control training base was inspected using a certified EXPERT simulator, which meets the requirements for initial training of air traffic controllers according to EASA. In the simulator, students receive basic training (BASIC), aerodrome control instrument rating in the tower (ADI (TWR)), approach control surveillance (APS), and area control surveillance (ACS) programmes. These learning tools are rarely available in other Universities delivering similar programmes and should be commended for the VILNIUS TECH programmes.

The panel examined the main aeronautics workshops designed for students to develop essential skills and perform practical tasks. Unmanned aircraft workshops are equipped with various technical equipment, with which students design and manufacture unmanned aerial vehicle systems. Laboratory computers for students are equipped with all the necessary CAD and CAM software for creating airplanes and calculations. Various drones were presented in the workshop, and solutions were introduced to increase the flight time of unmanned aircraft by developing innovative aerodynamic schemes and using renewable energy sources. All prototypes produced by students are tested at Kyviškės aerodrome. For drone production, students use CNC machine tools, 3D printers, computerised (CNC) milling machines, computerised (CNC) hot wire cutting, laser cutting, and engraving machines. For prototyping, these workshops are freely available to students to carry out their projects and final thesis. In the laboratory on satellite design, students are introduced to innovations with the main components. A stratospheric balloon project was presented.

VILNIUS TECH ensures study availability for students with special needs. Special software and hardware, unique furniture, and various tools for students with disabilities were purchased. Currently, the VILNIUS TECH Library has four jobs for students with special needs. In the Library, students can use Braille printers according to their special needs. The University's infrastructure is

fully adapted for students with disabilities: special conditions were created, ramps were built, and an elevator was installed.

VILNIUS TECH libraries have a modern self-service system for issuing and returning books, which allows visitors to borrow publications. All open library spaces provide free access to the available collection of printed publications, wireless internet, printing, and scanning services.

VILNIUS TECH library offers access to more than 542 thousand printed and e-information sources on various topics. To improve the availability of recommended literature, the Library uses the electronic service platform LUS Library-University-Student (LT-BUS) to develop students' ability to find, critically evaluate, and adequately use scientific information.

3.6.2. Evaluation of the planning and upgrading of resources needed to carry out the field studies

VILNIUS TECH periodically carries out the planning process for the financial year, during which funds and acquisitions are planned, the needs of equipment expenditure are discussed, and priorities are set. The University periodically performs computer equipment audits and improves or complements the established plans. The study programme committee coordinates the publications required for the study programmes with the Library. During the visit, it was clarified that VILNIUS TECH's activities were financed from four primary sources: state budget appropriations, own funds, targeted funding, and support funds. To ensure the need for e-books, the Library has been actively purchasing e-books since 2020. Moreover, VILNIUS TECH has its own publishing house, one of Lithuania's largest and most advanced academic publishing houses. All electronic publications and textbooks published and regularly published by VILNIUS TECH are free for all University students and academic and administrative staff. The decision should be taken to support students to pass the examinations of the core modules according to Part-147 approved organisation requirements.

The Strategic Action Plan is constantly monitored and developed at the University, providing measures for the renewal and development of the University's infrastructure. The University's infrastructure development plan has been approved since 2020. This plan aims to develop infrastructure sustainably and improve VILNIUS TECH's study, research, and work and leisure conditions. VILNIUS TECH's future solutions are based on science, innovation, and sustainable technologies, providing competitive advantages; therefore, to achieve continuous improvement, it was decided to bring together ambitious scientists, technical creation, and arts by using advanced technologies to solve societal challenges.

VILNIUS TECH is a flexible, efficient, enabling, and future-oriented ecosystem that connects science, business, the state, and global society. The University is the medium to grow talent at maximum speed, develop innovative companies, give birth to world-changing ideas, and offer solutions to current and future societal challenges. Continuous progress is achieved by mobilising internal resources and strategically expanding the network of academic and business partners. The University is open and global, uniting current and former students, researchers, and partners. Vilnius Tech campus environment connects virtual, mobile, and university spaces and promotes a closer connection with the city community. The leadership of the Technical University in developing innovative solutions is maintained.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. Physical and virtual learning environments adapted to self-learning, self-assessment, and individual needs;
2. The quality of studies fully complies with the learning facilities and resources on feedback from employers, students, teachers, and data monitoring.

(2) Weaknesses:

1. The decision should be taken to facilitate students' ability to pass the examinations of the core modules according to Part-147 approved organisation requirements.
2. The aviation maintenance hangar in the main facility should be more structured according to different study programmes (Avionics and mechanics).

3.7. STUDY QUALITY MANAGEMENT AND PUBLIC INFORMATION

Study quality management and publicity shall be evaluated according to the following indicators:

3.7.1. Evaluation of the effectiveness of the internal quality assurance system of the studies

The University documents governing the internal study quality assurance system and defines the processes of maintaining, monitoring and assessing the quality of studies at the University are listed in the SER (Page 73) and available in Lithuanian and English.

Surveys from students, Employer groups and teaching staff can submit their reports through the Department and Study Programme Committee levels, on to the Faculty Study Committee which then makes recommendations to the University Study Committee to address academic and other related quality issues of the learning environment. At University level, a summary of a five-year self-assessment at the University is prepared for national benchmarking carried out by the Centre for Quality Assessment in Higher Education.

For the programmes evaluated, this process is at a high standard, based on discussions during the visit and examination of data collection and surveys shown, conducted by teaching staff on the various modules/subjects. Students are directly involved in Programme Committees and decision making on the programmes in respect to changes requested through a Faculty Board. Some of the improvements made to the programme were partly due to previous questionnaires submitted by students and external evaluation panels which resulted in new resources and equipment and infrastructure and an increase in staff research activities and engagement with Industry. Work completed by students is subjected to plagiarism (Turnitin) software.

There are clear reporting structures to provide feedback through the various Departments and programme committees to address the issues raised.

3.7.2. Evaluation of the effectiveness of the involvement of stakeholders (students and other stakeholders) in internal quality assurance

One of the key strengths of education and training delivery within the programmes evaluated is the high level of collaboration with the stakeholders such as the Industry partners, Alumni and Social groups. Apart from supporting Internships, equipment supplies, physical training and career paths for graduates, they advise the management teams of trends and development within the sector which helps keep programmes current.

They participate in the Senate of the University, Faculty Councils, Study Field Committees and Study Programme Committees. The representatives of employers are included in all commissions of the final theses as well as in certification, competitive application process and qualification commissions. Final year students in particular participate in committee meetings on academic and quality issues and take part in decision-making on the development of study programmes and are invited to defend their final theses.

In meetings with teaching staff and students, it was evident that matters on academic quality can be addressed via the QA and management structures in place. The students have an opportunity to express their opinion about the quality of individual modules of their study programmes. Peer mentoring is particularly well developed for students. Students are well aware of their rights and entitlements and have highlighted how changes in teaching staff were implemented due to their requests and surveys.

These processes listed above have contributed to the current development of the equipment, new buildings and updated resources of the University in the programmes assessed.

As a recommendation, external examiners can play a key role in improving the quality of the assessment processes and facilities through formal reporting mechanisms

3.7.3. Evaluation of the collection, use and publication of information on studies, their evaluation and improvement processes and outcomes

During the visit of the Expert Panel to the university, management staff were preparing for publicity and exhibition events to secondary schools, promoting their range of equipment, programmes and activities of the University.

Student focused information (Research, Academic, Careers etc.) for current and prospective students is provided via the VILNIUS TECH Social media.

Relevant information for the current students is also communicated separately on a focused platform.

The Public Communication Office manages VILNIUS TECH social networks, becoming an increasingly important communication channel for making public University activities, studies, achievements and people.

Prospective students receive information through the VILNIUS TECH website. The information includes general data on the University, admission requirements and proposed study programmes, including objectives, learning outcomes and curriculum.

Student surveys are conducted and published on feedback relevant to the programmes, outlining satisfaction ratings and this is also submitted to a National Evaluation survey system for viewing.

Overall, the University and the Management staff are engaged and committed to collecting and providing relevant information on study programmes.

As a recommendation: the publication and promotion of good practice in education including success stories, student competitions, Erasmus and career paths/ international activities and social activities within a University can also contribute highly to the public's opinion and interest in the welfare of the learning environment and this type of information on extra curricular activities can be captured and marketed by staff and students to the benefit of all concerned.

3.7.4. Evaluation of the opinion of the field students (collected in the ways and by the means chosen by the SKVC or the HEI) about the quality of the studies at the HEI

Students and external social partners are systematically involved in the quality assurance process. Students are represented in governing committees such as: Council, Senate, Study and Programme committees, and Board of Appeal. Student feedback is sought on aspects of: quality of the course unit, quality of study programmes, graduate careers and competencies.

During the meeting with student representation, the panel has found that students cannot access the study timetable unless they complete a questionnaire for survey purposes – a measure that enforces feedback collection across all students. Some of the feedback provided to the panel by student representation included: a good balance of teaching challenges and exam/study responsibility workload, quality teaching materials that are available and accessible online, 80-90% of coursework assessments are based on group works, and easy to reach lecturers for support. A generalised survey results presented in the SER table 7, illustrate students' feedback on aspects of their study. Although most of the study aspects are rated well above 50%, however, it seems there are concerns with the study engagement and effort. This may well explain the relatively high non-completion rate of study on time (SER, table 5, Fig 13).

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. Students has a strong voice and presence on quality improvement of the study programmes
2. Multiple surveys are conducted to gauge students' opinion, expectation and satisfaction

3. Strong link with industry and other social partners that inform decisions made by management to improve the programmes, participate in final year project assessments and articulation to career and R&D

(2) Weaknesses:

1. External examiner to vet assessment materials across all levels

IV. EXAMPLES OF EXCELLENCE

1. High investment in programmes infrastructure
2. High quality laboratory, Aircraft workshops and Hanger facilities
3. R&D and thesis student work
4. Sharing of equipment with industry
5. Well developed programmes with good delivery of practical and theoretical knowledge
6. Good career paths for graduates
7. High liaison with staff and Industry through business developments and applied Research

V. RECOMMENDATIONS

Evaluation Area	Recommendations for the Evaluation Area (study cycle)
Intended and achieved learning outcomes and curriculum	It is recommended that the integration and requirements of EASA licensing content be more clearer and explicit in the programme structure, and support mechanism and route to licensing qualification are made available to those who wish to pursue such a career path
Links between science (art) and studies	The inclination towards interdisciplinarity in research, with projects in cooperation with other VILNIUS TECH departments and local partners, should be encouraged, to even better enrich the study programme with links to all aspects of applied sciences.
Student admission and support	It is recommended that a retention scheme is provisioned to cater for non-completion and/or termination of study
Teaching and learning, student performance and graduate employment	It is recommended that a graduate provision be considered to support those students who pursue licensing qualification in aircraft maintenance engineering.
Teaching staff	It is recommended to consistently continue in pursuing the hiring of young professionals and retaining PhD, which has been already positively implemented. Teaching staff should be encouraged to take advantage of mobility opportunities and to devote relevant efforts in the authorship of scientific publication in renowned international journals. As most of the lecturers/teachers are developing their academic careers and didactic and instructional skills, it is recommended to put more effort and emphasis on improving and developing these skills.
Learning facilities and resources	It is recommended that some forms of modern technology be implemented in the practical, training and workshop activities, these

	include but limited to: diagnostic equipment, inspection systems, avionics trainer and fault diagnostics, etc.
Study quality management and public information	It is recommended that a retention scheme be provisioned in the field monitoring structure to provide prompt support and guidance to those students who lack self-esteem, knowledge deficit, and/or adverse circumstances. The publication and promotion of good practice in education including success stories, student competitions, Erasmus and career paths/ international activities and social activities within a University can also contribute highly to the public's opinion and interest in the welfare of the learning environment and this type of information on extra curricular activities can be captured and marketed by staff and students to the benefit of all concerned. Knowledge Skills Attitude assessment could be implemented to the Aircraft Piloting degree.

VI. SUMMARY

Main positive and negative quality aspects of each evaluation area of the study field *Aeronautical Engineering* **at VILNIUS TECH:**

On behalf of the expert visiting panel, I would like to thank the Faculty staff and management teams for preparing the evaluation documents, organising the various groups and facilitating the visit. Most of our queries, questions and issues were addressed at the meetings during the visit. Vilnius Gediminas Technical University has invested substantial funding in its buildings, facilities, Aircraft Hanger and aircraft equipment, research and training activities for the educational programmes evaluated by the expert panel. The University offers a broad range of embedded programmes including 4-year Bachelor Degrees, 2-year Masters Degrees and 5-year integrated Masters Degrees, offering potential and current students a wide range of options and choices on their student experience journey with the University. The multitude of modules available provide numerous paths of learning for students. The academic standards of the programmes are at a comparable level in comparison to other Universities offering similar programmes. Modules and programmes are delivered via the English language which strengthen the programmes appeal to a broader student cohort. There is also good evidence of student mobility within the programmes.

The university is outward looking, designing its activities in line with European Universities through QA activities, Erasmus, work placements, collaborations with Industry and links with international organisations. R&D is multidisciplinary in nature and growing, however, the collaboration between staff and the industries could exploit research activities to a higher level as the engagement with Industry is of a high standard and offers opportunities to improve R&D and funding partnership activities. One area of improvement is to support staff in attending Conferences to develop their Research work and disseminate new knowledge. Staff have the opportunity to specify their work arrangements for the following year in agreement with their line manager which shows a very rewarding and staff focused approach to Teaching and Research.

There is a good demand for the programmes overall from prospective students with relevant entry standards. Marketing and Open Day campaigns take place during the year to promote the programmes, however, these can be enhanced via Social networks by promoting student activities such as project work and competitions on the website. The Programmes have attracted numerous students from other countries. The University has identified the market needs for the graduates in the national context. The time for students to become competent specialists in their field of study in

the Aerospace sector still requires further studies and practices. This should be analysed to see if the time for this can be reduced by introducing relevant modules required by the aviation certification organisations. Otherwise, there may be a drift by graduates to other engineering and technology companies unrelated to this sector.

In the curriculum, the broad range of modules are well established and meet the academic standards and requirements of the focused and broad engineering industries in Aerospace Engineering. There is a good emphasis on software such as ANSYS, SOLID WORKS and simulation software within the programmes.

Work placements/Internships undertaken provide an excellent way of developing students' experience, project work and knowledge, however, it may require a financial incentive from the industry for students in order to motivate them in completing the work to a higher standard. Practical activities for students within the University facilities is of a good standard and the expert panel did observe a broad range of equipment and practical workshops on site including satellite research work, antenna developments and general engineering workshops. Workshop facilities in the industry are also used extensively by students.

External examiners for inspecting exam papers, assignments, project work, thesis along with checking grades, independently interviewing students and providing feedback on the quality of the programmes each year is a development worth considering by the Programme Leaderships and Faculty Management.

Staff need to be facilitated and supported to undertake higher Degrees and opportunities to attend conferences should be supported. The teaching environment and facilities are appropriate for the programmes, especially the Aircraft Mechanics, Avionics and Piloting programmes.

Quality Assurance and ethical standards and documentation are well developed and structured within the University and adhered to.

Expert panel chairperson signature:

Prof. dr. David Kennedy