



STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

Vilniaus Gedimino technikos universiteto

**STUDIJŲ PROGRAMOS *ORLAIVIŲ PILOTAVIMAS* (valstybinis  
kodas – 601H41001)**

**VERTINIMO IŠVADOS**

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**EVALUATION REPORT**

**OF AIRCRAFT PILOTING (state code – 601H41001)**

**STUDY PROGRAMME**

At Vilnius Gediminas Technical University

1. **Prof. Laszlo T. Koczy (Chair of the Team),** *academic,*
2. **Prof. Giovanni Palmerini,** *academic,*
3. **Prof. Alessandro Aliakbargolkar,** *academic,*
4. **Maj. Andrius Stuknys,** *representative of social partners',*
5. **Mr Algirdas Navickas,** *students' representative.*

**Evaluation Coordinator Ms Eglė Grigonytė**

Išvados parengtos anglų kalba  
Report language – English

Vilnius  
2016

## DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	<i>Orlaivių pilotavimas</i>
Valstybinis kodas	601H41001
Studijų sritis	Technologijos mokslai
Studijų kryptis	Aeronautikos inžinerija
Studijų programos rūšis	Universitetinės studijos
Studijų pakopa	Vientisosios studijos
Studijų forma (trukmė metais)	Nuolatinė (5 metai)
Studijų programos apimtis kreditais	300 ECTS
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Aeronautikos inžinerijos magistras
Studijų programos įregistravimo data	Lietuvos Respublikos švietimo ir mokslo ministro 2006 m. lapkričio 16 d. įsakymu Nr. ISAK-2151.

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## INFORMATION ON EVALUATED STUDY PROGRAMME

Title of the study programme	<i>Aircraft Piloting</i>
State code	601H41001
Study area	Technological Sciences
Study field	Aerospace Engineering
Type of the study programme	University studies
Study cycle	Integrated
Study mode (length in years)	Full-time studies (5 years)
Volume of the study programme in credits	300 ECTS
Degree and (or) professional qualifications awarded	Master of Aerospace Engineering
Date of registration of the study programme	16 <sup>th</sup> November 2006, under the Order of the Minister of the Ministry for Education and Science of the Republic of Lithuania No. ISAK-2151.

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## I. INTRODUCTION

### 1.1. Background of evaluation process

The evaluation of on-going study programmes is based on the **Methodology for Evaluation of Higher Education Study Programmes**, approved by the Order No 1-01-162 of 20<sup>th</sup> December 2010 of the Director of the Centre for Quality Assessment in Higher Education (hereafter, SKVC). Evaluation is intended to help higher education institutions to constantly improve their study programmes and to inform the public about the quality of studies.

The evaluation process consists of the main following stages: 1) *self-evaluation and the Self-evaluation Report prepared by a Higher Education Institution (hereafter, the HEI)*; 2) *a visit of the Review Panel at the higher education institution*; 3) *preparation of the evaluation report by the Review Panel and its publication*; 4) *follow-up activities*.

On the basis of the study programme external evaluation SKVC takes a decision to accredit the study programme either for 6 years or for 3 years. If evaluation of the programme is negative such programme is not accredited.

The programme is **accredited for 6 years** if all evaluation areas were evaluated as “very good” (4 points) or “good” (3 points).

The programme is **accredited for 3 years** if none of the areas was evaluated as “unsatisfactory” (1 point) and at least one evaluation area was evaluated as “satisfactory” (2 points).

The programme is **not accredited** if at least one of evaluation areas was evaluated as “unsatisfactory” (1 point).

### 1.2. General

The application 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.	Updated “Aircraft Piloting” curriculum
2.	Updated list of publications; Updated list of teaching staff
3.	List of visiting professors and topics taught

### **1.3. Background of the HEI/Faculty/Study field/Additional information**

The programme evaluated is offered by Vilnius Gediminas Technical University (hereafter, VGTU), a Higher Education Institution based in Vilnius which dates back to 1956. It is managed by Antanas Gustaitis' Aviation Institute (hereafter, AGAI), and is an integrated programme, including both 1st and 2nd cycle levels for a grand total of 5 years curriculum. The study subjects to compose this 300 ECTS curriculum are offered by several Departments, belonging either to AGAI or to other University's divisions. The study programme is primarily devoted to prepare candidates to ATPL pilot license certifications, and to achieve higher education in the field of aviation. This degree satisfies the requirement for pilots in Lithuania to earn a higher education degree. Due to such a really specific interest, the size of the programme is necessarily limited in the number of enrolled students, who are indeed selected from a larger pool of candidates. The activities benefit of the cooperation of several institutional partners. It is clearly in the interest for the management body at AGAI and of the University at large to maintain a high quality standard for the programme.

### **1.4. The Review Panel**

The Review Panel was composed according to the *Description of the Review Team Member Recruitment*, approved by the Order No 1-01-151, 11/11/2011 of the Director of the Centre for Quality Assessment in Higher Education. The visit to the HEI was conducted by the Panel on 03/05/2016.

**1. Prof. Laszlo Koczy (Chair of the Team)**

*Professor at Budapest University of Technology and Economics, Hungary.*

**2. Prof. Giovanni Palmerini**

*Professor at Sapienza Università di Roma, Italy.*

**3. Prof. Alessandro Aliakbargolkar**

*Associate Professor at Skolkovo Institute of Science and Technology (Skoltech), Russia.*

**4. Maj. Andrius Stuknys**

*Commander's Deputy at Lithuanian Air Force Armament and Equipment Repair Depot, Lithuania.*

**5. Mr Algirdas Navickas**

*1<sup>st</sup> year student in Control Technologies (second cycle) study programme at Kaunas University of Technology, Lithuania.*

## II. PROGRAMME ANALYSIS

### 2.1. Programme aims and learning outcomes

The aim of the programme is “*to educate a specialist with a Master’s degree in Aeronautical Engineering as well as a licensed specialist with air transport pilot qualifications*” (p. 10, the SER). This aim responds to the vision and mission of the Long-term Development Strategy of the Lithuanian Transport System, which are respectively to create “*a modern and sustainable multimodal transport system, which by its technical parameters, safety and service quality will measure up to the level of the old EU Member States*”, and “*to guarantee a seamless mobility of the public and carriage of freight*” (Government of the Republic of Lithuania, Resolution No 692 of 23rd June 2005, par. 5-6).

The programme aim is quite well defined and clear. This kind of programme is unique in Lithuania and in the Baltic region. An improvement of it would be to state how the programme contributes developing specialists that will contribute to the mission of the Lithuanian air transportation system, which supposedly aim of having students achieved a higher education degree in addition to their flight credentials, instead of simply pursuing pilot licenses. The issue of managing multimodal transportation infrastructure requires a systems-level view of complex socio-technical challenges, going beyond traditional engineering education, and requiring students to obtain a comprehensive overview of global trends and evolutions of the air transportation industry. For example, the programme aim could be further improved as follows: “*to educate a specialist with a Master’s degree in Aeronautical Engineering as well as a licensed specialist with air transport pilot qualifications, able to contribute to plan, implement, and manage the evolution of modern and sustainable air transportation infrastructure in a national and European context*”. While the degree is focused on piloting, this is perhaps the most important feature distinguishing it from a flying school and needed to satisfy the overarching goal mandated by the Long Term Strategy of the Government. In later sections of this report, it is explained how this refinement of the programme aim may lead to consider some refinements for the continuous improvement of the programme.

The intended learning outcomes of the programme are grouped into four categories: *knowledge, cognition, special skills* and *general abilities* and are publicly accessible on the University website in Lithuanian and English languages<sup>1</sup>.

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<sup>1</sup> <https://medeine.vgtu.lt/programos/programa.jsp?fak=8&prog=72&sid=F&rus=U&klb=en>, (accessed in April 2016).

In the opinion of the Review Panel, intended learning outcomes of the programme are sufficiently well defined, yet few items for reconsideration have been found:

In the original intended learning outcomes is stated that students will gain knowledge of (p. 11, the SER):

- Z1 Mathematics: mathematical analysis, differential and integral calculations, differential equations, digital methods, theory of probability, statistics, MATLAB.
- Z4 Aeronautical knowledge of aircraft and their systems.
- Z6 Liberal arts and social sciences, law, management and economics, for broadening their world outlook.

Suggested revisions:

- Z1 Mathematics: MATLAB is not a mathematics skill, but rather a specific programming language. It is recommended to shift the focus to algorithm design and general programming skills.
- Z4 It is recommended to reformulate as “*Aeronautical knowledge of aircraft, their systems, and support infrastructure*”.
- Z6 The intended learning outcome is stated in generic terms (‘*law, management and economics*’). It is recommended the intended learning outcome to be reformulated in the specific context of aircraft piloting and its system-level environment.

Moreover two fundamental elements seem to be missing within the intended learning outcomes:

- The intended learning outcomes do not include mention for students to acquire an overview of the air transportation industry, which is essential if they are to operate the piloting profession while cognizant of the national and international context. This would distinguish the higher education degree from being a simple ATPL training course.
- No explicit mention to flight and airport safety and security from the engineering point of view is made in intended learning outcomes. While some of these elements can be found in specific study subjects in the *Aircraft Piloting* curriculum (such as in the *Flight Procedures* subject) there seems to be not a strong focus on these topics, which are becoming more and more essential in nowadays’ aviation operations. These elements are essential considerations and high level priorities in nowadays planning and management of air transportation systems. To meet these priorities, new dedicated study subjects in flight and airport safety (or a unified subject for both topics) are highly recommended.

The programme aims and intended learning outcomes are based on the need for professional aviation specialists as defined by the Lithuanian Civil Aviation Authority (CAA 2005 04 29

written form No 12R-33-808): between 15 and 20 aircraft pilots per year between a pessimistic and optimistic scenario, respectively. Based on the discussions with alumni and social partners (the Civil Aviation Administration and the Military Academy), it is clear that the Lithuanian labour market definitely needs this programme. According to the regulations of the Military and CAA, this programme is the only source for human resources recruitment in the field of aircraft piloting.

The content of the programme is based on academic requirements in conformity with Lithuanian Republic Law on Higher Education and Research and other legal acts. The programme aims and intended learning outcomes cover the majority of disciplinary areas from the academic point of view. However, as it was mentioned previously the intended learning outcomes should be extended towards offering a wider view of the air transportation industry especially in an European context.

Generally, the programme aims and intended learning outcomes are consistent with the type and level of studies and level of qualifications offered. The programme offers a unique combination of professional skills in aircraft piloting that helps achieving professional qualifications in a short time, and it gives the competences for leadership and carrying out research that is required from a Master's graduate. This combination allows a flexible career choice, even change from professional to academic paths and the other way round. As a result, programme aims, intended learning outcomes and study subjects have clear enough links and possibly result in a good level of professional qualifications.

The name of the programme, its intended learning outcomes, content and the qualifications offered are compatible with each other, because the programme offers the professional skills including a large number of practice hours towards aircraft piloting and at the same time the ten semester programme addresses major areas of academic fields associated with aircraft piloting. However, as the Panel stated above, a wider view of the air transportation industry in the European area should be included in the academic programme.

## ***2.2. Curriculum design***

*Aircraft Piloting* is an integrated 5-year study programme worth 300 ECTS. The number of ECTS credits meets the legal requirements for integrated study programmes<sup>2</sup>. The SER contains

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<sup>2</sup> Order of the Minister for Education and Science of the Republic of Lithuania "General Requirements of First Degree and Integrated Study Programmes"



some contradictions concerning the number of credits per semester. During the site visit, a corrected and updated study plan was presented which fully meets the legal requirements including 30 ECTS for every of 10 semesters. Flying practice covers a total of 31 ECTS, meeting legal requirements in terms of practice for the integrated study programme<sup>3</sup>. The final thesis of the programme covers 30 ECTS. The study subjects are spread evenly, and their themes are not repetitive. The design of the curriculum is quite traditional; as such, it does not fully reflect the latest achievements in science and technologies, nor it recognizes the evolution and increased responsibility of the role of airline pilots in multimodal airline transportation systems. Elements for modernization of the curriculum that the Review Panel wants to highlight are the following:

- No study subject in the curriculum offers students a broad overview of the air transportation industry and its value chain – essential elements of knowledge required to improve air transportation-specific management skills of the *Aircraft Piloting* programme;
- The curriculum does not offer any subject in flight safety from the engineering point of view and air transportation security (including airport security), which are deemed to be critical elements that are highly relevant to airline piloting and the broader air transportation industry context;
- The curriculum does not offer specific training in integrated logistics support, which is needed for understanding the concept of aircraft operations in a commercial and military environment.
- The curriculum does not offer specific knowledge in operations research, network modeling, and mathematical programming, which are critical research skills in the area of air transportation (for instance, in research related to airline logistics planning).
- The curriculum does not offer explicit internship opportunities within relevant Lithuanian organizations, as means to tighten the link and facilitate the transition of the graduate workforce between the university programme and its social partners.
- The curriculum seems to be mostly based on traditional frontal lectures. A renovation of teaching methods is recommended, including consideration of active teaching and active experiential learning within the education activities.

Besides these occurrences, the scope of the programme is sufficient to ensure the achievement of the intended learning outcomes. Additionally, the content of the study subjects is just partially

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<sup>3</sup> Order of the Minister for Education and Science of the Republic of Lithuania “General Requirements of First Degree and Integrated Study Programmes”

consistent with the level of the studies and thus only partially appropriate for the achievement of the intended learning outcomes. The inclusion of the mentioned academic areas would largely improve the competences of the graduates, especially in leadership and research-related careers.

### **2.3. Teaching staff**

The supplementary information sent after the site visit reports 36 lecturers engaged into the programme, including 2 professors, 20 associate professors, 10 lecturers and 4 assistants. Of the reported 36, 22 (2 professors and 20 associate professors) are holders of a doctoral degree. It should be noted that the number of teachers provided in the SER is different (42) and the Panel experienced difficulties in fully understanding the situation with the teaching staff of the programme.

The study field subjects indicated in the SER (p. 16) are: “*Flying, Aviation English 1, Aviation English 2, Rules of Radiotelephony, Aviation English 3,4, Aircraft functional systems, General information about the aircraft: airframe, airports and their light signal systems, Aircraft general knowledge: aircraft instruments, General knowledge of aircraft: engines, Radionavigation, Aviation and Flight Safety, Aircraft general knowledge: electrical, communication and electronic systems, Meteorology*”, “*Principles of Flight; Air Law; Aviation English 5,6,7; Integrated Course Project; Flight Procedures; Flight Characteristics and Planning; Air Transportation Management; Human Performance and Limitations; Aircraft Radio Navigation Systems 1; Aircraft Radio Navigation Systems; Aircraft Radar Systems; Multi-crew Co-operation (MCC); Professional Practices (Flight practice 1,2,3,4), Final thesis (1,2,3)*”. Attention should be paid that in the Annex 2 of the SER “List of Academic Staff”, *Principles of Flight* (6 ECTS) is absent (it may be the “Fundamentals of Flight” subject taught by Mr. Sitonis, Assistant). *Air Law* (4 ECTS) is absent (it may be “Law” subject taught by Dr. Radzevičius). *Flight Procedures* (3 ECTS) is absent. *Human Performance and Limitations* (6 ECTS) is absent. *Aircraft Radio Navigation Systems* (6 ECTS), including *Aircraft Radio Navigation Systems 1* (6 ECTS) are absent (they may be the “Aircraft Electronic Navigation Systems 1/2 (practice work)” taught by Professor Stankūnas. *Multi-crew Co-operation (MCC)* is absent (and not reported in the Table 4 of the SER, p. 16, thus the number of ECTS is unknown). The total number of ECTS for study field subjects (reported in the Table 4 of the SER p. 16) is reported as 207 ECTS, but it is actually 208 ECTS (67+95+16+30). Of those 208 ECTS roughly 97 ECTS are taught by PhD

holders<sup>4</sup>. There is a danger of the legal requirements not being fulfilled in the near future unless the number of PhD holders in the study field will soon increase and several associated professors are promoted to professors.

The pedagogical skills and experience of the lecturers is sufficient. They are adequate to ensure the achievement of the most of the intended learning outcomes, yet it is unclear how they are able to satisfy the need for development of research skills as lecturers seem not to be strongly engaged in international research projects. Participation in international research as reported in the SER is limited only to European projects (FP6, CEARES, ECARE) and does not include any active participation in Horizon 2020. Yet the University reports being engaged in the BEAWARE project to foster the latter. The increase of research activities especially in an international context including the participation at the major international conferences and publication in leading scientific journals is strongly recommended. Participation and presentation of papers to conferences as in the IEEE series in Systems or Aerospace or AIAA will provide to the staff a chance to increase and definitely improve the quality of research.

Lack of a strong research focus is also reflected in the limited number of publications of the lecturers, which are mostly confined to Lithuanian conference and journal venues. The issue of weak research capacity here reported has also been identified by the previous Review Panel that evaluated the programme in 2013 (the Annex 5, the SER).

Considering the overall population of the teaching staff, their qualification is adequate, however specific part of the staff involved in aviation should definitely increase its research and publication activity. Close collaboration with other Faculties is strongly recommended. Such collaboration might include the migration of individual staff members from other Faculties to AGAI.

On the other hand the Review Panel found the staff of AGAI to be very strongly motivated and dedicated to this particular programme. This fact was also supported by the unanimous positive comments by the students and the alumni in the meeting with the Panel.

Several new staff members joined AGAI in the last three years. A number of visiting professors are regularly involved in the programme delivering lectures on updated topics. Continuous attention to turnover issues is continuously recommended. Of particular relevance were the open

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<sup>4</sup> Again, as the numbers provided in different places of the SER are mixed, also some data are missing, accordingly the Review Panel was unable to fully understand the situation.

lessons given by Visiting Professor Dr. Dieter Georg Schmitt from Airbus, in particular, his “*Air Transport as Part of the Global Transportation System*” lectures. This example is at the core of the Panel’s recommendation of providing graduates a system-level view of the air transportation industry. However, instead of being a 1h 30m lecture, such content should be expanded to a full study subject, taught by VGTU AGAI staff (not by visiting lecturers).

The programme curriculum highlights the predominant use by the teachers of traditional frontal teaching methods and written exam assessments. The Panel highly recommends training of lecturers in active teaching methods and to look into modern engineering education approaches such as those promoted by the Worldwide CDIO Initiative ([www.cdio.org](http://www.cdio.org)).

Professional development of lecturers is likewise required to develop systems-thinking and industry knowledge skills to allow the modernization of the curriculum by specializing generic study subjects (*Law and Management*) into aviation-specific ones and the development of the air transportation industry overview subject. Such modernization may be allowed by VGTU since the University already requires every professor or associate professor to improve their skills at least once with internships in Lithuania and abroad (p. 23, the SER).

The Review Panel observed that considerable resources are continuously improving the professional side of the programme, including the development of facilities equipment and new aircraft (helicopters, in particular). If a larger percentage of these resources would be concentrated on academic activities and research developments, a better balance of the two sides of the programme could be achieved with the staff of AGAI.

#### ***2.4. Facilities and learning resources***

The teaching and learning equipment are likewise adequate, both in their size and quality. The Review Panel was deeply impressed by the amount and up-to-dateness of available facilities and equipment meeting very high professional standards. VGTU AGAI provides students with an integrated Air Traffic Control simulator, AVI-I 108 flight simulators (12 work places,) one FNPT-II-MCC multipurpose aircraft simulator, 6 single engine Cessna-152, 2 single engine Cessna-172, 3 single engine Cessna-172S, one twin engine Piper PA34-220T, and two helicopters CABRI G2. Excellent teaching facilities are the landmark of VGTU AGAI.

It should be noted that additional facility infrastructure is currently under construction. Once complete, all equipment that is right now scattered across multiple buildings will be moved to a single, modern facility. This all makes for excellent arrangements to enable flying practice for

students and provide enough capacity for the typical class size of the *Aircraft Piloting* programme.

Teaching materials are adequate and accessible to students in the necessary amount. Digital databases are available in the library (except IEEEExplore) and there is the possibility to obtain specific scientific literature (paid articles) through the library, if necessary.

### ***2.5. Study process and students' performance assessment***

The admission requirements are well-founded. Admission to the programme is based on the general procedure accepted by the Republic of Lithuania. It is necessary to have completed secondary education (exam grades in *Mathematics, Physics, Lithuanian Language, Foreign Language* or any subject from LAMA BPO accepted list). There are no entrance exams (p. 27, the SER). Admission interest is 3 times higher than admission quotas. There are 73 students enrolled as per the academic year 2015/16 (p. 22, the SER). This ensure the enrollement of the brightest and most motivated students. The drop-out rate of the programme is very small; since 2012/13, only 3 first year students left AGAI (p. 29 the SER).

The organisation of the study process ensure adequate provision of the programme and the achievement of the intended learning outcomes; an area of further improvement, as discussed in the Section 2.1, is to consider revising the intended learning outcomes and curricular offer accordingly in order to modernize the programme to face the needs and complexities of the current air transportation market.

Only a limited number of students is involved in a research activity. Students must be much more encouraged to participate in this specific activity which is considered as an instrumental in obtaining a Master's degree.

While students are encouraged by the University to participate in mobility activities, yet the mobility of the students seems to be quite low; less than 8 students per year (between academic years 2012/13 and 2015/16) took an advantage of international mobility (p. 30, the SER). It has to be considered that the involvement in programmes like ERASMUS is extremely important for students, and it is even more relevant if not mandatory for the ones pursuing disciplines like air traffic control. In fact, the overall world of aeronautics is deeply "international". It is a good opportunity for VGTU AGAI to extend the mobility option to its junior students, in particular for *Aircraft Piloting* programme which requires presence at AGAI in later phases of the studies due

to the flight practice. It is encouraged to establish new connections with international top level universities in this regard.

Academic and social support to students is adequate. According to students remarks on the site visit, teachers are readily available to help and assist students in their learning process. The website of the programme provides sufficient information to students, they also are provided with personal e-mail addresses and remote access to educational systems. Scholarship opportunities are provided to students as well. Dormitory space is available and adequate to cover the needs of the programme.

As far as the Review Panel could experience, the assessment system of students is correct and adequate, however the assessment of the academic performance might become stricter when an increased involvement of the students in research activities would raise thesis to a quality level that more corresponds to the international expectations for a Master's degree.

The management of VGTU AGAI provides support to students to find jobs. The professional activities of the majority of graduates meets the programme providers' expectations. This evidence is strongly confirmed by the feedback received from alumni during the site visit of the Panel.

## **2.6. Programme management**

Programme management decisions for the *Aircraft Piloting* study programme are left to the Study Programme Committee, headed by the Curator of the programme Assoc. Prof. Vytautas Rimša. The Study Programme Committee analyses and evaluates the study subjects of the study field, and ensures feedback between the programme executors, students, graduates and social partners. Both social partners and the Military confirmed their involvement in the monitoring and improvement of the programme. From the analysis of the provided documentation, it appears that responsibilities for decisions and monitoring of the implementation of the *Aircraft Piloting* programme are clearly allocated.

The information on the staff involved in teaching within the frame of the programme has not been updated. As in the SER, no publications since year 2012 appear. Following the request of the Review Panel an updated list of publications was made available, however such a lack of updated information about the staff raises questions and concerns on how the implementation of the programme is continuously monitored. Suggestions and remarks from the previous Review

Panel have not been fully implemented as well (such as the increase in research activities for the second cycle degree programme).

As part of the management of the programme, the Review Panel also have to mention a couple of additional weak points of the SER, such as contradictory and imprecise data on study subjects credits and a large number of missing CVs of the academic staff.

In the opinion of the Review Panel, internal quality assurance measures are partially efficient, rather good in the professional part of the programme, but need improvement in the academic part, especially involving stronger research activity.

Several additional remarks in terms of study programme management are to be made:

- 1) It is necessary to form critical skills for professionals in the field of air transportation planning and management;
- 2) Students and lecturers mobility needs to be significantly increased and possibly paired with joint research collaborations;
- 3) The research and publication activity seems still to be weak compared to an expected standard for a national university; students and lecturers need to be encouraged to participate in research projects and publish their results in top-tier peer-reviewed journal publications and conference proceedings.

The internal quality assurance of the programme is quite effective, as it accounts for external reviews organized by the Centre for Quality Assessment in Higher Education in Lithuania, and produces self-evaluation reports on a two-year basis. Both academic and administrative staff and students are involved in the improvement of the quality management system and the evaluation of the study process and its results. Students are provided with an online questionnaire to provide their opinions to the VGTU Quality Management Department. An example of the functioning of this system is that students requests concerning exchange of teaching staff in several problematic cases were accepted. As a result, it appears that the evaluation and improvement processes involve stakeholders.

### III. RECOMMENDATIONS

1. Improve the qualifications of academic staff; foster research activity, publication productivity in high scientific level peer-reviewed journals and conferences, and international mobility with leading universities in the area, increase the scientific collaboration with other Faculties of the University.
2. Develop new study subjects in air transportation industry overview (current and future vision about aviation systems), operations research, mathematical programming, optimization methods, integrated logistics support, flight safety (also from the engineering point of view) and air transportation security. Revise the intended learning outcomes accordingly to account for those improvements.
3. Consider revising study subjects teaching methodologies to include active teaching and modern engineering education practices, e.g. CDIO ([www.cdio.org](http://www.cdio.org)).
4. Increase mobility both for staff and students.
5. Continuous monitoring of the academic activities of the staff in order to ensure the quality should be carried on.



#### **IV. EXAMPLES OF EXCELLENCE**

The aircraft and helicopter fleet available for students' training and flight practice is remarkable, and sets an example for universities worldwide developing aeronautical engineering and aviation-related higher education degree programmes.

The relations with the external stakeholders are very good, as evidenced by the feedback from alumni and employers during the site visit.

The Review Panel also would like to highlight the very high motivation and dedication of the academic staff to the programme.

## **V. SUMMARY**

The Review Panel find the quality of the study programme evolving in the direction of continuous improvement. Strengths of the programme include an extensive aircraft and helicopter fleet available to students' training and flight practices. Training facilities are well equipped and are undergoing a renewal process, with significant investments in a new building that will host all VGTU AGAI simulation equipment. The programme responds to a clear need elicited by the competent authorities of the Government of the Republic of Lithuania, and can be considered unique and essential for the country. Some parts of the programme implementation, as discussed in this report (in particular with reference to increased research activity and additional study subjects) could be improved.

The major weaknesses of the programme are that the programme does not offer students an overview of the air transportation industry, and other critical mathematical and research skills that set the difference between a simple ATPL instruction and a higher education degree. The quality and qualifications of the academic staff has improved compared to the previous external evaluation in 2013, however significant steps in this regard are still needed. The study subjects seem to be formulated using traditional and sometimes outdated engineering education approaches. Publication productivity and international mobility of the students and staff of the programme seem limited.

## VI. GENERAL ASSESSMENT

The study programme *Aircraft Piloting* (state code – 601H41001) at Vilnius Gediminas Technical University is given a positive evaluation.

*Study programme assessment in points by evaluation areas.*

No.	Evaluation Area	Evaluation of an area in points*
1.	Programme aims and learning outcomes	2
2.	Curriculum design	2
3.	Teaching staff	2
4.	Facilities and learning resources	4
5.	Study process and students' performance assessment	3
6.	Programme management	2
	<b>Total:</b>	<b>15</b>

\*1 (unsatisfactory) - there are essential shortcomings that must be eliminated;

2 (satisfactory) - meets the established minimum requirements, needs improvement;

3 (good) - the field develops systematically, has distinctive features;

4 (very good) - the field is exceptionally good.

Grupės vadovas: Team leader:	Prof. Laszlo Koczy
Grupės nariai: Team members:	Prof. Giovanni Palmerini
	Prof. Alessandro Aliakbargolkar
	Maj. Andrius Stuknys
	Mr Algirdas Navickas

**VILNIAUS GEDIMINO TECHNIKOS UNIVERSITETO VIENTISŪJŲ STUDIJŲ  
PROGRAMOS *ORLAIVIŲ PILOTAVIMAS* (VALSTYBINIS KODAS – 601H41001) 2016-  
07-14 EKSPERTINIO VERTINIMO IŠVADŲ  
NR. SV4-170 IŠRAŠAS**

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**VI. APIBENDRINAMASIS ĮVERTINIMAS**

Vilniaus Gedimino technikos universiteto studijų programa *Orlaivių pilotavimas* (valstybinis kodas – 601H41001) vertinama **teigiamai**.

<b>Eil. Nr.</b>	<b>Vertinimo sritis</b>	<b>Srities įvertinimas, balais*</b>
1.	Programos tikslai ir numatomi studijų rezultatai	2
2.	Programos sandara	2
3.	Personalas	2
4.	Materialieji ištekliai	4
5.	Studijų eiga ir jos vertinimas	3
6.	Programos vadyba	2
	<b>Iš viso:</b>	<b>15</b>

\* 1 - Nepatenkinamai (yra esminių trūkumų, kuriuos būtina pašalinti)

2 - Patenkinamai (tenkina minimalius reikalavimus, reikia tobulinti)

3 - Gerai (sistemiškai plėtojama sritis, turi savitų bruožų)

4 - Labai gerai (sritis yra išskirtinė)

&lt;...&gt;

**V. SANTRAUKA**

Ekspertų grupės manymu, studijų programa yra nuolat tobulinama. Studijų programos stiprybės: didelis orlaivių ir sraigtasparnių parkas, kuriuo studentai gali naudotis treniravimuisi ir skrydžių praktikai. Patalpos, skirtos studijoms, yra tinkamai įrengtos ir šiuo metu atnaujinamos; didelės investicijos yra skirtos naujam pastatui, į kurį bus perkelta visa VGTU AGAI simuliacinė įranga.

Studijų programa atitinka Lietuvos Respublikos Vyriausybės kompetentingų institucijų poreikius ir yra unikali bei svarbi šaliai. Kai kurios studijų programos dalys, nurodytos šiose vertinimo išvadose, turėtų būti tobulinamos (ypač susijusios su aktyvesne mokslinių tyrimų veikla ir papildomais studijų dalykais).

Pagrindinės šios studijų programos silpnybės: programoje yra nedėstomi studijų dalykai, leidžiantys studentams įgyti oro transporto pramonės ir kitų esminių matematikos ir mokslinių tyrimų vykdymo žinių bei įgūdžių, kurie skiria paprastą ATPL licenciją nuo universitetinio išsilavinimo. Nors akademinis personalas ir yra aukštesnės kvalifikacijos, lyginant su ankstesniu išoriniu vertinimu, atliktu 2013 m., tačiau ši sritis vis dar išlieka tobulintina. Studijų dalykai sukurti naudojant tradicinius, o kartais ir pasenusius požiūrius į inžinerijos mokslą. Programos studentų ir dėstytojų įsitraukimas į mokslo tiriamąją veiklą ir jų tarptautinis judumas yra riboti.

<...>

#### **IV. IŠSKIRTINĖS KOKYBĖS PAVYZDŽIAI**

Orlaivių ir sraigtasparnių bazė, kuria studentai gali naudotis treniravimuisi ir skrydžių praktikai, yra puiki. Tai pavyzdys pasaulio universitetams, plėtojantiems aviacijos inžineriją ir su aviacija susijusias studijų programas.

Programos vykdytojų ryšiai su išorės dalininkais – labai geri. Tai pagrindžia vizito metu iš absolventų ir darbdavių gautas grįžtamasis ryšys.

Ekspertų grupė taip pat norėtų pabrėžti programą vykdančių dėstytojų motyvaciją ir atsidaivimą savo darbui.

<...>

#### **III. REKOMENDACIJOS**

1. Kelti dėstytojų kvalifikaciją, skatinti mokslo tiriamąją veiklą, aktyviau skelbti publikacijas gerai vertinamuose recenzuojamuose moksliniuose žurnaluose ir konferencijose, skatinti tarptautinį judumą bendradarbiaujant su universitetais, kurie yra šios srities lyderiai, didinti mokslinį bendradarbiavimą su kitais universiteto fakultetais.
2. Dėstyti naujus studijų dalykus, orientuotus į oro transporto pramonę (aviacijos sistemos dabartinė ir ateities vizija), operacijų mokslinius tyrimus, matematinę programavimą, optimizavimo metodus, integruotą logistikos pagalbą, skrydžių saugumą (taip pat iš

inžinerijos perspektyvos) bei oro transporto saugumą. Atsižvelgiant į šiuos pakeitimus, peržiūrėti numatomų studijų rezultatų formuluotes.

3. Apsvarstyti galimybę iš naujo peržiūrėti studijų dalykų dėstymo metodikas, įtraukiant aktyvaus mokymo ir šiuolaikinio inžinerinio ugdymo praktikas, pvz., CDIO ([www.cdio.org](http://www.cdio.org)).

4. Didinti dėstytojų ir studentų judumą.

5. Nuolat stebėti dėstytojų akademinę veiklą jos kokybei užtikrinti.

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