



STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

KAUNO TECHNOLOGIJOS UNIVERSITETO
AVIACIJOS INŽINERIJA PROGRAMOS (612H41003)
VERTINIMO IŠVADOS

EVALUATION REPORT
OF *AVIATION ENGINEERING (612H41003)*
STUDY PROGRAMME
at KAUNAS UNIVERSITY OF TECHNOLOGY

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Išvados parengtos anglų kalba
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DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	<i>Aviacijos inžinerija</i>
Valstybinis kodas	612H41003
Studijų sritis	Technologijos mokslai
Studijų kryptis	Aeronautikos inžinerija
Studijų programos rūšis	Universitetinės studijos
Studijų pakopa	Bakalauras
Studijų forma (trukmė metais)	Nuolatinės (4), iššęstinės (6)
Studijų programos apimtis kreditais	240
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Aviacijos inžinerijos bakalauras
Studijų programos įregistravimo data	Švietimo ir mokslo ministro įsakymas SR-1611, 2011-04-14

INFORMATION ON ASSESSED STUDY PROGRAMME

Name of the study programme	<i>Aviation Engineering</i>
State code	612H41003
Study area	Technological sciences
Study field	Aerospace Engineering
Kind of the study programme	University Studies
Level of studies	Bachelor
Study mode (length in years)	Full-time (4), part time (6)
Scope of the study programme in credits	240
Degree and (or) professional qualifications awarded	Bachelor of Aviation Engineering
Date of registration of the study programme	Decree of Minister of Education and Science SR-1611, 2011-04-14

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The Centre for Quality Assessment in Higher Education

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I. INTRODUCTION

The Program *Aviation Engineering* (1st cycle) at Kaunas University of Technology has been run since 2011. It represents an evolution of previously existing programs in the wider field of transport engineering, now more specialised in the field of aviation engineering. This is the first Program assessment.

The *Aviation Engineering* study programme is assigned to the study field of Aeronautical Engineering and the graduates of this programme will receive a Bachelor's degree in Aviation Engineering.

The purpose of the *Aviation Engineering* first cycle study programme is to satisfy the need of highly qualified specialists in the rapidly developing aviation infrastructure of Lithuania by ensuring preparation of professionals who could make a significant contribution to the development and implementation of new aircraft maintenance technologies and design processes thus increasing competitiveness of the Lithuanian transport infrastructure. The main activity area of the trained specialists will be aircraft maintenance and design. A Lithuania Aviation market analysis has been performed through certificated Lithuanian Civil Aviation Administration requirements and existing military organizations.

External evaluation of Kaunas University of Technology (KTU) study programme has been conducted by an international expert group through analysis of the self-evaluation report and meetings with the administrative staff of the faculty of Aviation Engineering, the group of preparation of the self-evaluation report, teaching staff of the study programme, current students of the programme and social partners.

The expert group has analysed the programme aims and learning outcomes, curriculum of the programme, quality assurance (management) of the programme, study process, staff and the learning environment.

II. PROGRAMME ANALYSIS

1. Programme aims and learning outcomes

The Program aims and learning outcomes are well defined and clear, publicly available on the website of the University, although the English page of the program is not as complete as the Lithuanian page. The assessed *Aviation engineering* study programme is focused on the need of highly qualified aviation engineering specialists in the enterprises of Lithuanian aviation infrastructure and the functions these specialists should be able to take. The graduate will be able to analyse and solve engineering problems, to design equipment, processes and methods, to use appropriate methods for investigation of the problems of functionality and reliability of aircrafts and their systems, to apply the acquired knowledge and to develop practical skills, related to design, exploitation and improvement of aircraft systems. The graduate will have specific knowledge and skills in two specialization areas: Design of Aircraft; Technology of Aircrafts' Technical Maintenance.

The Program aims, structure and expected Learning Outcomes are based on the analysis of trends in the labour market 2010-2012 that revealed that the number of aviation engineering specialists in the country does not meet even minimum needs of its economy, and besides their average age are close to that of retirement. The demand of Aircraft maintenance and Aircraft design specialists declared by the institutions carrying out activities or having interests in the

mentioned sphere indicates the need of 30-40 students to be admitted to *Aviation Engineering* first cycle study program each year. Social Partners confirm that there are growing needs in the sector, and would even recommend to develop a Master program in the field. The course is designed according to some requirements set by the Civil Aviation Administration (CAA), so that graduates from this program will easily get a CAA license for maintenance.

The Program aims and Learning Outcomes are consistent with the type and level of the qualification offered and are in line with the principles and recommendations of the Bologna Declaration and the subsequent documents. The study programme learning outcomes are formulated in conformity with the programme purpose and aims, so that the graduates having achieved them would be able to solve issues in the field of aviation mechanics engineering. The learning outcomes are distributed into six groups: knowledge and understanding, engineering analysis, engineering design, investigation, engineering practice, personal/transferable skills.

The name of the programme, its learning outcomes, content and the qualifications offered are compatible with each other. Out of the intended learning outcomes it is revealed that the main focus of the study programme is the acquisition of knowledge in the field of aeronautics and the development of skills for application of them. This is in conformity with the study level of the first cycle.

2. Curriculum design

The curriculum design meets legal requirements for the first study cycle studies, set by the Ministry of Education and Science. It is also in line with the content requirements of the Lithuanian General regulations for the study programmes in the study area of Technology. Total volume of the programme is 240 ECTS, general subjects of university education and social sciences subjects cover 21 ECTS, subjects of the study field are 180 ECTS is dedicated for the study field subjects, 96 ECTS within is dedicated for specialisation subjects. 12 ECTS are reserved for optional subjects. The preparation and defence of the final thesis comprises of 12 ECTS. The number of credits for the practical training is of 15 ECTS. The number of course units per semester does not exceed 6. Distribution of workload between the general and specialization courses is appropriate.

Study subjects and modules are spread evenly, with 30 credits per semester, the content of the modules is not repetitive and follows a clear sequence, the study courses are placed according to a logical structure.

The content of the subjects and/or modules is consistent with the type and level of the bachelor studies. The course units are arranged so that in the first years the students acquire the theoretical knowledge and develop the skills for its application, in the final years more specialised units are studied. With the final thesis students have to show their ability to apply knowledge in the solution of practical problems.

According to the description of each unit there is a fair correlation between study programme's intended learning outcomes, course contents and study methods and study assessment methods.

The scope of the programme is sufficient to ensure the expected learning outcomes, since it offers a wide variety of relevant subjects. The maintenance program has been designed by existing actual structure of aircraft maintenance taking the outcomes from stakeholders, but only the mechanical specialization branch meets the professional needs with respect to working structure. Social Partners point out that the avionics maintenance subjects are not really developed, they need to employ graduates from other programs for this specialisation. According

to social partners, the percentage needs for the mechanical branch is 70 % and for the avionics branch is 30 %. There seems to be also a lack of more specialised courses in aerodynamics.

There is a periodic revision and update of the study modules and course programmes, and learning resources include recent publications. However, there is no evidence that the newest technologies and achievements effectively included in the revision of the programme and its courses.

3. Staff

The teaching staff meets the legal requirements, over 86 % of teaching workload is provided by teachers holding a scientific degree. The academic staff teaching in the programme includes 9 Professors and 15 Associate Professors. Staff members are well balanced according to age groups and experience.

The qualifications of the teaching staff are adequate to ensure learning outcomes and the procedure for appointing lecturers should assure their quality. Teachers and researchers are appointed to their positions at the University by means of open competition.

The number of the teaching staff is adequate. Subjects of *Aviation Engineering* study programme are delivered by 33 teachers. Teaching staff workload is extremely variable within the programme and in a general individual perspective. It is remarked that only one teacher is devoted to teach only in this programme, indicating a minor engagement in core aeronautics-related disciplines.

The teaching staff turnover is able to ensure an adequate provision of the programme. Turnover of lecturers in the study programme according to age groups during the period under evaluation is in relation with the strategic aim of the university authorities to reduce the mean age of the lecturers. Out of the academic staff teaching in the programme, 4 Associate Professors are under the age of 40. The program administration has plans to enrol PhD students as teachers, further experts from the industry to provide specialised seminars, and it is estimated that 4 or 5 current Associate Professors should become Professors within 5 years.

The higher education institution creates conditions for the professional development of the teaching staff necessary for the provision of the programme. Although the self-evaluation report does not include any statement on lecturer traineeship system, the discussions with the program administration and teachers pointed out that there are several mechanisms in place for this and teachers must show their improvement of skills every 5 years. Mechanisms include academic exchange, short courses and placement periods, incoming visiting professors. Teachers curricula show that mobility is encouraged and teachers do have exchanges in foreign countries and/or participate in active training in research centres or companies.

Teachers are involved in scientific research projects, financed at national and EU level, also through the technology research center. However, only a small subset of the research projects mentioned is relevant to the study programme, and there is at the moment no direct involvement in international events and conferences related to aeronautics. This should be strongly pursued by the teaching staff for the benefit of the program.

4. Facilities and learning resources

The premises for studies are adequate, appropriately sized for the number of students in the programme.

The teaching and learning equipment available at the moment of the site visit need some improvement. Computer equipment and software is appropriate, laboratory equipment for the introductory courses is adequate but for the more specialised courses the equipment has yet to be purchased. It is understood from the discussion with the program administration that this equipment is foreseen and should be adequate for the program. The interview with employers showed that they are willing to contribute to the laboratory development, the program administration should strongly consider this opportunity.

The arrangements for students' practice are adequate. The self-evaluation report contains no information on the practice of the students done in companies during placement periods, but the interview with the students pointed out that they can start having practice since the first year of studies.

The teaching materials (textbooks, books, periodical publications, databases) are adequate and accessible. Course programs include appropriate lists of suggested readings, and all the specialisation subjects include suggested readings in English language. Although the tendency is toward a completely digital library, it is suggested to provide some additional printed copies of the most recent textbooks that are suggested as learning material for students.

5. Study process and student assessment

The admission requirements are well-founded and appropriate for the study program. Teachers interviewed claim that, compared to other programs, students enrolled in the *Aviation Engineering* program perform well.

The organisation of the study process should ensure an adequate provision of the programme and the achievement of the expected learning outcomes. It must be noticed that at the moment only the first two years of the course are offered, so no real information is provided on the effectiveness of some study methods that will be adopted in the final years of the program.

Students are involved in research and applied research activities, through project work and practical exercises in courses.

Students have opportunities to participate in student mobility programmes. Measures are taken to allow students to have this opportunity, and the students are well informed about the process. However, students have had so far no international exchange experience. According to the interviewed students, there is a lack of appropriate agreements with Universities offering curricula similar to the one offered at KTU.

The university ensures an adequate level of academic and social support. Students are provided with all the needed information concerning the university study programme, are provided with sport, lustiness and culture support and some of them get social scholarships. These appear good opportunities for the students, no data are provided on how many students actually benefit from this support, but the interview with the students confirmed the existence of the support and the students consider it good.

The assessment system of students' performance is clear and adequate. Students find all the information on the KTU website.

The matching of professional activities of the graduates and the programme providers' expectations can't be assessed, since at the moment only the first two years of the course are offered. However, social partners declare to be satisfied with the skills and competencies of the students they received so far for practice.

6. Programme management

Responsibilities for decisions and monitoring of the implementation of the programme are clearly allocated in accordance with the Statute of KTU. The issues of the study programme are being solved by the Study Program Committee. The proper conduction of the programme and its improvements are ensured by the programme coordinator – head of the Department of Transport Engineering.

The Self-Assessment Report states that the statistical data on the implementation of the programme are collected regularly. Students are evaluating content of study subjects and their quality after the end of each. Evaluation concerns study subject, teaching methods, lecturer's competence, communication skills and give their proposals. Interviews with students confirm this fact, and students feel that their evaluation is taken into account. Results of the inquiries are available for the study programme coordinator, heads of departments, deans of faculties and lecturers, and the Department Head has the power to enforce changes. According to the employers, their feedback relating to this study programme is also taken into account, although the process is not formalised through the establishment of a specific committee.

The outcomes of internal and external evaluations of the programme are used for the improvement of the programme, as confirmed by the students, teachers, program administration and social partners.

Quality assurance approach is sound. The general structure is the same throughout the university, study committee at the faculty, then at the university, and this structure is realised in this programme.

III. RECOMMENDATIONS

1. Take measures to establish some core aeronautics-related laboratory.
2. Further develop the avionics maintenance branch, currently not satisfactory for the employment of the graduates, or revise the program aims and learning outcomes accordingly.
3. Take measures to enrol as teachers some identifiable specialists and increase the research activities and publications in core aeronautics-related disciplines.
2. Take measures to support and promote student mobility, by revising agreements specific for the aviation engineering course.

IV. SUMMARY

Overall, the study programme *Aviation Engineering* at Kaunas University of Technology is given positive evaluation. The evaluation team recognizes that the weak points of the program are known by the program managers and there is a tendency towards improvement that needs time to be fully implemented.

Programme aims and learning outcomes

Positive quality aspects

There are growing needs in the sector. Approved design and production organizations are taking the students immediately for the working activities and only some months experience is needed to incorporate them totally. Approved maintenance organizations are interested to employ the students immediately even from the first course providing flexible work load, salary and working license.

Negative quality aspects

The program aims state that the graduate has specific knowledge and skills in two specialization areas: Design of Aircraft; Technology of Aircrafts' Technical Maintenance, however for technical maintenance only mechanical specialization branch meets the professional needs with respect to working structure, avionics specialization branch needs further improvement.

Curriculum design

Positive quality aspects

The scope of the programme is sufficient to ensure the expected learning outcomes, since it offers a wide variety of relevant subjects. The maintenance program has been designed by existing actual structure of aircraft maintenance taking the outcomes from stakeholders. The course is designed according to some requirements set by the CAA, so that graduates from this program will easily get a CAA license for maintenance.

Negative quality aspects

Social Partners point out that the avionics maintenance subjects should be further developed, they need to employ graduates from other programs for this specialisation. According to social partners, the percentage needs for the mechanical branch is 70 % and for avionics branch is 30 %.

Teaching staff

Positive quality aspects

The qualifications of the teaching staff are adequate to ensure learning outcomes, number of the teaching staff is adequate, teaching staff turnover is able to ensure an adequate provision of the programme.

Negative quality aspects

Only one teacher is devoted to teach exclusively in this programme, indicating only partial engagement in core aeronautics-related disciplines. In addition, only a small subset of the research projects of the teaching staff are relevant to the study programme, direct involvement in international events and conferences related to core aeronautics disciplines should be increased.

Facilities and learning resources

Positive quality aspects

The premises for studies are adequate, appropriately sized for the number of students in the programme, laboratory equipment for the introductory courses is adequate and arrangements for students' practice are adequate.

Negative quality aspects

The teaching and learning equipment available at the moment of the site visit need some improvement. Computer equipment and software is appropriate, laboratory equipment for the introductory courses is adequate but for the more specialised courses the equipment has yet to be purchased. It is also suggested to provide some additional printed copies of the most recent textbooks that are suggested as learning material for students.

Study process and students' performance assessment

Positive quality aspects

The admission requirements are well-founded and students enrolled in the Aviation Engineering program perform well. The university ensures an adequate level of academic and social support. Social partners declare to be satisfied with the skills of the students they received so far for practice.

Negative quality aspects

There is a need for a revision of exchange agreements specific for the aviation engineering course, to create better mobility opportunities for students, important for successful acquiring of most of the General Abilities as part of the program learning outcomes.

Programme management

Positive quality aspects

Responsibilities for decisions and monitoring of the implementation of the programme are clearly allocated. The employers are in the loop and are willing to contribute to the program development.

Negative quality aspects

The feedback of employers relating to this study programme is taken into account, but it is not formalised through the establishment of a specific committee, this would give more strength to the employers' involvement.

V. GENERAL ASSESSMENT

The study programme *Aviation Engineering* (state code – 612H41003) at Kaunas University of Technology is given **positive** evaluation.

Study programme assessment in points by fields of assessment.

No.	Evaluation Area	Evaluation Area in Points*
1.	Programme aims and learning outcomes	3
2.	Curriculum design	3
3.	Staff	3
4.	Material resources	3
5.	Study process and assessment (student admission, study process student support, achievement assessment)	3
6.	Programme management (programme administration, internal quality assurance)	3
	Total:	18

*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.

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**KAUNO TECHNOLOGIJOS UNIVERSITETO PIRMOSIOS PAKOPOS STUDIJŲ
PROGRAMOS AVIACIJOS INŽINERIJA (VALSTYBINIS KODAS – 612H41003) 2013-
06-11 EKSPERTINIO VERTINIMO IŠVADŲ NR. SV4-196 IŠRAŠAS**

<...>

V. APIBENDRINAMASIS ĮVERTINIMAS

Kauno technologijos universiteto studijų programa *Aviacijos inžinerija* (valstybinis kodas – 612H41003) vertinama teigiamai.

Eil. Nr.	Vertinimo sritis	Srities įvertinimas, balais*
1.	Programos tikslai ir numatomi studijų rezultatai	3
2.	Programos sandara	3
3.	Personalas	3
4.	Materialieji ištekliai	3
5.	Studijų eiga ir jos vertinimas	3
6.	Programos vadyba	3
	Iš viso:	18

* 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)

<...>

IV. SANTRAUKA

Kauno technologijos universiteto studijų programa *Aviacijos inžinerija* vertinama teigiamai. Vertinimo grupė supranta, kad programos silpnosios pusės yra žinomos programos vykdytojams ir matomos programos tobulinimo tendencijos, kurioms įgyvendinti reikia laiko.

Programos tikslai ir studijų rezultatai**Stipriosios pusės**

Poreikiai šiame sektoriuje auga. Pripažintos projektavimo ir gamybos organizacijos nedelsiant priima studentus į darbą ir visiškai studento integravimui į darbą tereikia vos kelių mėnesių patirties. Pripažintos techninės priežiūros organizacijos yra suinteresuotos priimti į darbą net pirmą kursą baigusius studentus, skirdamos jiems lankstų darbo krūvį, atlyginimą ir darbo licenciją.

Silpnosios pusės

Studijų kokybės vertinimo centras

Programos tiksluose numatyta, kad absolventas įgyja specialiąsias žinias ir įgūdžius dviejose specializacijos srityse: orlaivių projektavimas ir orlaivių techninės priežiūros technologijos, tačiau techninės priežiūros specializacijoje tik mechanikos specializacijos šaka atitinka profesinius reikalavimus, susijusius su darbo struktūra, o aviacijos elektronikos specializacijos šaką reikia toliau tobulinti.

Studijų turinys

Stipriosios pusės

Programos apimtis yra pakankama, kad būtų užtikrinti numatyti studijų rezultatai, nes joje siūloma didelė aktualių dalykų įvairovė. Techninės priežiūros programa sudaryta pagal dabartinę orlaivių techninės priežiūros struktūrą atsižvelgiant į suinteresuotųjų šalių pastabas. Kursas sudarytas pagal CAA nustatytus reikalavimus, todėl šios programos absolventai lengvai gaus CAA techninės priežiūros licenciją.

Silpnosios pusės

Socialiniai partneriai nurodo, kad aviacijos elektroninių sistemų priežiūros dalykus reikėtų toliau tobulinti, šiai specializacijai jie turi priimti į darbą kitų programų absolventus. Pasak socialinių partnerių, mechanikos šakos absolventų poreikis siekia 70% o aviacijos elektroninių sistemų – 30%.

Personalas

Stipriosios pusės

Dėstytojų kvalifikacija yra pakankama, kad būtų užtikrinti studijų rezultatai, dėstytojų skaičius yra pakankamas, dėstytojų kaita užtikrina tinkamą programos įgyvendinimą.

Silpnosios pusės

Tik vienas dėstytojas dėsto išimtinai tik šioje programoje, tai rodo tik dalinį įsitraukimą į pagrindines su aeronautika susijusias disciplinas. Be to, tik nedidelės dalies dėstytojų mokslinių tyrimų projektai yra susiję su studijų programa. Tiesioginis dalyvavimas tarptautiniuose renginiuose ir konferencijose, susijusiose su pagrindinėmis aeronautikos disciplinomis turėtų būti didesnis.

Materialieji ištekliai

Stipriosios pusės

Studijoms skirtos patalpos yra pakankamos ir tinkamo dydžio numatytam programos studentų skaičiui, įvadinio kurso laboratorinė įranga yra tinkama ir studentų praktika yra tinkamai organizuota.

Silpnosios pusės

Vizito aukštojoje mokykloje metu turimą mokymo ir studijų įrangą reikia šiek tiek tobulinti. Kompiuterinė ir programinė įranga yra tinkama, įvadiniam kursams skirta laboratorinė įranga taip pat tinkama, tačiau labiau specializuotų kursų įrangą dar reikia įsigyti. Taip pat siūloma studentus aprūpinti papildomomis naujausių vadovėlių kopijomis, kurie yra siūlomi kaip studijų medžiaga.

Studijų eiga ir studentų vertinimas

Stipriosios pusės

Priėmimo reikalavimai yra pagrįsti ir *Aviacijos inžinerijos* programos studentų rezultatai yra geri. Universitetas užtikrina reikiamą akademinę ir socialinę paramą. Socialiniai partneriai teigia, kad jie yra patenkinti studentų, kurie pas juos atliko praktiką, įgūdžiais.

Silpnosios pusės

Reikia peržiūrėti dėl *Aviacijos inžinerijos* programos sudarytus mainų susitarimus, sudaryti geresnes judumo galimybes studentams, nes tai svarbu, kad bendrieji įgūdžiai, kurie yra programos studijų rezultatų dalis, būtų sėkmingai įgyti.

Programos vadyba

Stipriosios pusės

Aiškiai paskirstyta atsakomybė už su programos vykdymu susijusius sprendimus ir jos vykdymo stebėseną. Darbdaviai yra įtraukti ir nori prisidėti prie programos tobulinimo.

Silpnosios pusės

Į darbdavių atsiliepimus apie šią studijų programą atsižvelgiama, tačiau šis procesas nėra formalizuotas įsteigiant konkretų komitetą. Tai padarius darbdaviai būtų dar labiau įtraukti.

III. REKOMENDACIJOS

1. Imtis priemonių, kad būtų įsteigta pagrindinių aeronautikos dalykų laboratorija.
2. Toliau tobulinti aviacijos elektroninių sistemų priežiūros sritį, šiuo metu ji yra nepatenkinama absolventų įsidarbinimo požiūriu; arba atitinkamai peržiūrėti programos tikslus ir studijų rezultatus.
3. Imtis priemonių, kad dėstytojais būtų įdarbinti pripažinti specialistai ir vykdyti daugiau mokslinių tyrimų, taip pat rengti daugiau publikacijų, susijusių su pagrindinėmis aeronautikos disciplinomis.

4. Imtis priemonių studentų judumui palaikyti ir skatinti peržiūrint sutartis, sudarytas konkrečiai Aviacijos inžinerijos kursui.

<...>

Paslaugos teikėja patvirtina, kad yra susipažinusi su Lietuvos Respublikos Baudžiamojo kodekso¹ 235 straipsnio, numatančio atsakomybę už melagingą ar žinomai neteisingai atliktą vertimą, reikalavimais.

¹ Žin., 2002, Nr. 37-1341.