



FACULTY OF AERONAUTICS
TECHNICAL UNIVERSITY OF KOSICE



ANNUAL REPORT
2017

**TECHNICAL UNIVERSITY OF KOSICE
FACULTY OF AERONAUTICS
SLOVAK REPUBLIC**



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TECHNICAL UNIVERSITY OF KOSICE
FACULTY OF AERONAUTICS
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Preamble

The year 2017 from the perspective of the Faculty of Aeronautics of the Technical University of Kosice could be characterized and described in one word as “revolutionary” probably the best one. The meaning of this word in the Slovak dictionary of synonyms means “*causing far-reaching changes; having a great meaning*”, perhaps best characterized by breakthrough changes I think are far-reaching not only the future but also the far future of the Faculty.

The most extensive reform process in the short history of the Faculty started in May 1, 2017 when the Faculty management changed. The undesirable and unsustainable state of the Faculty in which the new leadership took the Faculty over was one of the main reasons for the start of revolutionary reform steps in all the areas of its life.

In the area of the organizational structure of the Faculty, we have reduced the number of the existing six departments to five and have done subsequent redistribution changes of both the members and the seat of one of the departments. This process was also closely related to the process of reducing the number of Faculty staff, and the emphasis was put on the efficiency of the structure of the departments in relation to the number of students bound to the guaranteed study programs also in relation to the quality of scientific and publishing outputs. One of the factors supporting the necessity of this process has also been the successful introduction of a new system of evaluation of the scientific and pedagogical staff and doctoral students of the Faculty - SHOK, which pointed out in the above-mentioned areas and confirmed the necessity of these changes.

In the area of education, several fundamental changes were made or prerequisites for their successive progress were created in the short term. Based on the Faculty's proposal, the Accreditation Commission approved a wide-ranging change of guarantors and co-guarantors of individual accredited study programs at all three levels of education at the Faculty of Aeronautics. These changes concerned all three fields of study “*Motor Vehicles, Rolling Stock, Ships and Airplanes; Electronics; and Transport*” in which university education is provided at the Faculty of Aeronautics. The necessity of this change was accomplished due to both the high age of the guarantors and the insufficient quality of their scientific work and publications in terms of the criteria set by the Accreditation Commission for acceptance of guarantors for individual fields of study.

Following the positive recommendations of the Accreditation Commission, in October 18, 2017, the Ministry of Education, Science, Research and Sport of the Slovak Republic introduced a new field of study 5.02.61 Aeronautical and Aerospace Engineering. This fact has opened us the way for a subsequent reform change aimed at reducing the current three research fields of study, in which the Faculty of Aeronautics works, to two creating more favourable conditions for the process for the next complex accreditation, its successful management and subsequent higher ranking.

Likewise, following the ever-increasing demands of aeronautical practice, we have begun the process of updating but also removing duplicates of lectured topics in individual study programs, as well as in degrees of education. This process we want to continue in 2018.

In the field of science and research of the year 2017 the emphasis was put on increasing the success of the acquisition of science and research projects having international level. As a result of our efforts in 2017, we have already started the international project of research, development and innovation “*Simulation of Interventions in Air Accidents*”, our faculty started to solve in cooperation with the University of Pardubice and the University of West Bohemia in Pilsen.

In close cooperation with our partners we have also set up a “favourable starting position” for two other science and research projects under the Research and Innovation Program: “*Research and Development Centre for Aircraft Maintenance and Training for Aircraft Maintenance Personnel*” and “*Determination of Effective, Individual Training Programs for Pilots / Flight Crew in the Field of Stress and Stress Situations Using Virtual Reality Simulation Tools to Improve Air Traffic Safety*” which were successfully contracted in 2017 with the anticipated start of their solution in 2018.

In terms of improving the infrastructure and the training base of the Faculty, due to the lack of funds we made changes aimed at improving the aesthetic aspect of the exterior but also the interior of the Faculty of Avionics but without the need for significant financial investments. Even the minimal funding, the qualitative shift in this area is quite strong.

The area of deepening cooperation with aeronautical companies has a significant impact on increasing Faculty reputation and its position in the Slovak aviation. The Faculty of Aeronautics

has played an important part in the opening of the new helicopter training centre *the Slovak Training Academy* on 30/11/2017 at Kosice Airport, which is also a proof of progress in this area. The founding of this new training centre was as symbolic confirmation of the more than 111-year tradition of aviation in Kosice and also created a solid foundation for the continuation of the famous tradition of practical air training in Kosice. In cooperation with our partners, we are fully prepared to provide students with a place for high-quality theoretical training conducted according to the current European Aviation Legislation standards and thus to continue being successful to spread the goodwill of aviation expert training in Kosice.

I want to believe that the “*revolutionary*” reform changes that we decided about in 2017, have laid the foundation for a desirable and inevitable “*restart*” of the Faculty of Aeronautics, and the results and positive benefits will be apparent to employees and especially to the Faculty students in the following year 2018.

Dr.h.c. doc. Ing. Stanislav Szabo, PhD., MBA, LL.M

Dean

Faculty of Aeronautics

Technical University of Kosice



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SCIENTIFIC BOARD

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ACADEMIC SENATE

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Ing. František HEŠKO

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Ing. Alica TOBISOVÁ , PhD.

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Tomaš ZELINKA

Members of Academic Senate TUKE

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Ing. Juraj VAGNER, PhD.

Ing. Viktor BALAŠČÍK



KOSICE – THE RESIDENCE OF THE FACULTY OF AERONAUTICS TUKE

Kosice is the second largest city of the Slovak Republic. The first written reference to the city with the historical name CASSOVIA dates back to the 13th Century. In the first half of the 14th century Kosice had already been a free royal town. In December 1654, there was the first grammar school established in 1657 - the University of Academia Cassoviensis, renamed in 1776 to the Royal Academy - Academia Regia Cassoviensis. Kosice city is also interesting with its architecture. The old town has been declared an Urban Conservation Area. In the centre, the Cathedral of St. Elizabeth is known as one of the most monumental expression of Gothic art in Europe.

The Technical University of Kosice was established in 1952, but in fact, the origin and roots of the two faculties go back to the 18th century and they are derived from the Mining Academy in Banská Štiavnica. The University is a state-supported institution. At present, the University consists of nine faculties. It has about 10 000 students and 900 academic staff members.

The Faculty of Aeronautics was established on 1 February 2005 as a successor of the Air Force Academy of Milan Rastislav Štefánik in Kosice, which had been a prestigious educational institution in Europe and in the world having provided university education for pilots and air operating personnel for over 30 years. The main mission of the faculty is to contribute to the tasks of the Technical University, especially in the area of air technologies, aeronautics and astronautics. The faculty from its beginning has focused on complex aviation issues, has provided university education and has conducted the scientific research and development in traditional areas of aviation: the management and security of aviation, aerospace engineering, avionics and construction, maintenance and operation of aeronautical products as a part of three scientific fields with accredited study programs at all three university degrees.

DEPARTMENTS

The scientific and teaching staff of the Faculty of Aeronautics, Technical University in Kosice includes five departments with specialized focus on different areas of aviation issues.

Academic Departments	Responsibilities
Department of Avionics	school subjects focused on avionics, airborne instruments, aircraft electrical systems, airborne radio and radio-technical systems and special systems of aircraft
Department of Aviation Technical Studies	related to the aviation engineering, aviation and industrial sensorics and magnetometrics, aviation mechanics and material, aviation electro-technics, electronics and cybernetics
Department of Flight Training	preparation of the flying staff, personnel of air traffic control, simulator training of crews and air traffic controllers
Department of Aviation Engineering	preparation of a ground and flying staff in the aircraft design theory, aeronautical engines, ground servicing and airfield operations
Department of Air Transport Management	school subjects focused mainly on the area of management, organization and supervision of air traffic operations, economics and regulations of civilian managerial specialties

EDUCATION AND COURSES

Courses offered

The Faculty of Aeronautics offers three types of full-time and part-time courses:

Bachelor's Degree courses (3 years) leading to degree Bc.

Master's Degree courses (2 years) leading to degree Ing.

Doctoral Study courses (3 years) leading to degree PhD.

Level	Title	Courses	Study field	
1.	Bc	Air Transport Management	3772	Transport
		Professional Pilot		
		Air Traffic Controller		
		Aircraft Operation	2353	Motor vehicles, rail vehicles, ships and airplanes
		Avionics Systems	2613	Electronics
2.	Ing.	Air Transport Management	3772	Transport
		Aircraft Operation	2353	Motor vehicles, rail vehicles, ships and airplanes
		Sensorics and Avionics Systems	2613	Electronics
3.	PhD.	Air Transport Management	3772	Transport
		Aircraft Operation	2353	Motor vehicles, rail vehicles, ships and airplanes
		Sensorics and Avionics Systems	2613	Electronics

CREDIT-BASED SYSTEM

STATISTICS

Present number of faculty staff members is 86 including 5 professors, 17 associate professors, 35 PhD. lecturers, 1 assistant lecturer, 3 research workers, 25 administrative staff and technicians.

Number of students

The number of BSc. students is 364, number of MSc. students is 237, number of external PhD. students is 28 and daily PhD. students is 14.



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1. DEPARTMENT PROFILE

The Department of Avionics provides courses in subjects such as aeronautical electronics, aeronautical devices, cybernetic aircraft systems, aircraft electrical systems, radio and radio systems of aircraft, special aircraft airborne systems, air communications and information systems, signal processing and transmission.

It guarantees and provides university education for the following issues:

- in the first degree of university education
 - in Bachelor's degree programs: Avionic Systems, Sensory (Study Section 5.2.13, Electronics)
 - in Bachelor's degree programs: Air Traffic Control, Professional Pilot, Air Traffic Controller, Aircraft Operations,
- in the 2nd degree of higher education - in the engineering programs Avionic systems, Sensory and avionics (Study Department 5.2.13, Electronics)
- in the 3rd level of higher education - in the doctoral program "Aeronautical and industrial electronic systems" (Study Department 5.2.13 Electronics)

It carries out scientific and research activities, especially in selected areas of avionics, aircraft, aircraft electrical systems, radio and radio systems of aircraft, special aircraft airborne systems, selected areas of signal processing and transmission, accuracy and durability of radio electronic systems against interference, operation, technical diagnostics of radio

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DEPARTMENT OF AVIATION TECHNICAL STUDIES

DEPARTMENT CHARACTERISTICS

The Department ensures the teaching of specialized electrotechnical subjects for the aviation electrotechnical and engineering study programs at the FA and of the fundamental natural science subjects for all of the study programs at the FA.

EDUCATIONAL ACTIVITIES

The Department guarantees the university education provided:

- in the 1st degree of the university study - in the bachelor study program Avionics systems (the study branch 2613 Electronics), Aircraft operations (the study branch 2353 Motor vehicles, rail vehicles, ships and aircraft), Air Transport management, Professional Pilot and Air Traffic Controller (the study branch 3702 Transportation).
- in the 2nd degree of the university study - in the masters study program Sensors and avionics systems (the study branch 2613 Electronics), Aircraft operations (the study branch 2353 Motor vehicles, rail vehicles, ships and aircrafts), Air Transport management (the study branch 3702 Transportation).
- in the 3rd degree of the university study - in the doctoral study program Aviation and industrial electronic systems (the study branch 2613 Electronics), Aircraft operations (the study branch 2353 Motor vehicles, rail vehicles, ships and aircrafts), Air Transport management (the study branch 3702 Transportation).

RESEARCH AND DEVELOPMENT ACTIVITIES

The Department performs research and development activities in the chosen parts of the aviation electrotechnics:

- applied magnetometry in the aviation, space and industrial systems,
- development and optimization of magnetic sensors design and characteristics,
- development of effective calibration methods of sensors for aviation and industrial systems,
- development of communication technologies for remotely piloted aircrafts,

in the chosen parts of physics:

- study of dielectric properties of magnetic fluids,
- study of physical properties of chosen magnetic materials and magnetic microwires,
- study of magnetic principle of the heating mechanism - hypertherm in the magnetic nanoparticle system,

in the chosen parts of the mathematics with the focus on the:

- numerical methods of equations and partial differential equations,
- operational analysis, graph theory, hypergraphs and combinatorial structures,
- didactics of the subjects' teaching.

MANAGEMENT OF THE DEPARTMENT

Head of Department Assoc. Prof. Ing. Václav MOUCHA, CSc.

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DEPARTMENT OF FLIGHT TRAINING

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DEPARTMENT PROFILE

The Department of Flight Training (KLP) was established on 01/09/1973 as one of the founding departments of the Military Aviation University of the Slovak National Uprising. After the merge of the Air Force Academy of General Milan Rastislav Stefanik and Technical University in Kosice, the Faculty of Aeronautics was established and the department became a part of it. The department provides teaching of subjects focusing in particular on the issue of theoretical training of flying personnel, ATC staff, simulation training of flying personnel and air traffic controllers. It also involves teaching students in the theoretical courses of flight training and air traffic control.



DEPARTMENT OF AVIATION ENGINEERING

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DEPARTMENT'S PROFILE

The Department of Air Traffic Management (KMLP) was established on 01/09/2004, as one of the scientific and educational institutions after merging the Institute of Aeronautics of the Air Force Academy of General M.R. Stefanik with the Technical University of Kosice under the Law №455/2004 and Act №131/2002 on University Education. After completion of the transformation process on 01/02/2005 the Faculty of Aeronautics became part of TUKE. The department personnel has years of experience in training civilian and military aviation specialists, pilots and other members of the Air Force in air transport management. The Department of Air Transport management was transformed from the Department of Combat and Operational Use in Air Force - its predecessor, which was a part of the Air Force Academy in Kosice.

PARTNERS OF FACULTY





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