

Innovation activity in National aviation university

Dmytro Bugayko Leading researcher of scientific research administration of National aviation university, PhD in economics, associate professor

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75 YEARS HISTORY OF THE NATIONAL AVIATION UNIVERSITY

- → 2000 National Aviation University
- → 1994 Kyiv International University of Civil Aviation
- → 1965 Kyiv Institute of Civil Aviation Engineers
- → 1947 Kyiv Institute of Civil Air Fleet
- → 1933 Kyiv Aviation Institute

National Aviation University is a state-owned institution of higher education nationally accredited to Level IV. It is one of Ukraine's leader in training, retraining and professional development for the students obtaining Bachelor, Specialist and Master Degrees.

Founders of university powerful scientific schools were academicians O.Kukhtenko and G.Pukhov, corresponding members M.Golego, O.Pen'kov, O.Aksionov, professors T.Bashta, A.Grokholskiy, B. Ilnitskiy and others. The University takes pride its graduate – the well know scientist in the sphere of aviation and cosmonautics, chief designer of space rocket systems academician V.Chelomei.

SCIENTIFIC - TEACHING STAFF

The academic process at the University is provided by the highly skilled teaching staff which includes 15 Academicians and **Corresponding Members of the Academy of** Science of Ukraine, 270 Doctors of Sciences and Professors, 900 Candidates of Sciences and Associate Professors, 80 Honored Persons in science and technology of **Ukraine and State Prize laureates.**

NUMBER OF STUDENTS (Total – 50 thousands)



National Aviation University is a large higher educational establishment wellknown both in Ukraine and far abroad. For the years of its existence the University has trained over 150 thousand Specialists and Masters and over 5 thousand Candidates and Doctors of Science in many fields of country's economics, science and technology.

The University has also trained thousands of specialists in advanced areas for 126 countries of the world. Nowadays more than 50 thousand students study at all University's structural departments accounting for 1200 foreign students from 44 countries.

Educational courses include practical recommendations and are based on documents of *European Civil Aviation Conference* (ECAC), *European Aviation Safety Agency* (EASA) and EUROCONTROL. The University has been successfully collaborating with the International Civil Aviation Organization (ICAO). It is also a place for two ICAO European Regional Training Centers which provide training and retraining for personnel of aviation companies of Ukraine and other countries of the world. Both centers use the generally-acknowledged TRAINAIR methods based on ICAO Standards and Recommended practices.

The National Aviation University takes an active part in many international programs with foreign universities, training centers, associations and companies. NAU co-operates with more than 100 foreign scientific and training institutions of Russia, Germany, France, Poland, Spain, Azerbaijan, Belorussia, Lithuania, Latvia, Italy, Georgia, Vietnam, South Korea, India, China, Turkey and other countries.

STRUCTURE OF THE UNIVERSITY



CAMPUS OF THE UNIVERSITY



The area occupied by the University is about 100 hectares, the total floor space area of the 14 academic buildings being about 200,000 square meters

TRAINING HANGAR



The University has a training aerodrome, unique hangar, radio equipment and aviation ground equipment facilities, aerodynamic and training complexes, State Museum of Aviation.

UKRAINIAN STATE MUZEUM OF AVIATION



NAU DIRECTIONS OF SCIENTIFIC AND RESEARCH ACTIVITIES

- Metrology, Control, Diagnostics;
- Information Security;
- Specialized Computer Systems and CALS-Technologies;
- Mathematical Modeling and Numerical Approaches;
- Computer Technologies;
- Aeronavigation;
- Aerospace Systems of Monitoring and Management;
- Automatic Process Control Systems;
- Complicated Technologies System Management;
- Modeling in Electric Engineering, Electronics and Lighting Systems;
 - Electrodynamic and Electronic Systems;
- Radioelectronic Complexes and Avionics;
- Psychological Support in Aviation;
- Aviation English and Flight Safety;
- Civil Aviation State Regulation and Organizational Legal Support;
- Legal Problems in Space Activities Business Orientation;
 International Relations in the Context of Global Safety:
 Problems and Challenges.

NAU DIRECTIONS OF SCIENTIFIC AND RESEARCH ACTIVITIES

- •Power Generating Systems;
- Sophisticated Tribotechnologies;
- •Safety in aviation;
- Automatization and Energy Saving in Transport Industry;
 Design, Maintenance Diagnostics in Aircraft Engineering;
 Chemical Engineering, Chimatology and Applied Chemical Technologies;
- Urban, Industrial, Civil and Transport Engineering;
 Industrial Design, Architecture;
- Ecological and Technotronic Security;
- Geodesy and Geoinformation Systems;
- •Economic and Management Business Processes of Aviation Enterprises Development;

INNOVATION ACTIVITY IN NAU



1. Aircraft and space technology

10 scientific – research centers and laboratories

STATE SCIENTIFIC & RESEARCH INSTITUTE OF AVIATION



Scientific and methodic support of aircraft overhaul at the repair plants of the Ukrainian Defense Ministry, programs of aircraft repair according to their technical conditions, new technologies application, repair quality ensuring

AERODYNAMIC RESEARCH CENTER

- The facility includes 4 by 2.5 meters TAD-2 low speed wind tunnel intended for development and research including two-phase flows, 0.75 by 0.42 meters UTAD-2 low speed wind tunnel and large 4 by 4 meters TAD-1 wind tunnel. Services:
 - Models Development and Manufacturing;
 - Sophisticated Data Analyses and Use;
 - Calculation of Stability and Control Characteristics;
 - Flight Dynamics Modeling;
 - Flight Vehicle Development;
 - Subsonic Wind Tunnels Development;
 - Wind Tunnel Operators Training.





STRENGTH DIAGNOSTIC OF AIRCRAFT CONSTRUCTIONS ON A SURFACE CONDITION

Researches:

•Evolution of deformation relief of cladding layer on the surface of aluminum-base alloys under fatigue;

•Changes of surface physicomechanical properties (microhardness, a Young's modulus) under operation loading;

•Evolution of system of the surface dispersed microcracks before forming critical damages.

INTERFERENCE NON-CONTACT 3D PROFILE MEASURING DEVICE



80 nm

Technical characteristics:

Software Interface





The etalon for calibration AFM

silicon etching step

NANOINDENTIONAL AND SCATCH TESTER

It is a high precision instrument for determination of nanomechenical properties of thin films, coatings and substrates by DSI and Scratch Testing methods





Scratch testing method



AUTOMATED RELIABILITY OF AIRLINE AIRSHIPS PARK CHECKING SYSTEM



2. Aerospace systems of monitoring and navigation of mobile objects

8 scientific – research centers and laboratories

AEROSPACE CENTER. EXPERIMENTAL EQUIPMENT





Developed equipment for navigation field monitoring gives opportunity to evaluate GPS, GLONASS, GALILEO, SBAS, GBAS real-time accuracy, continuousness maintenance and operation availability.

GPS, EGNOS, GALILEO MONITORING



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GEODESIC GPS-COMPLEX



😋 710Batch - GraiNav Batch



Reverse



Mobile geodesic GPS- receiver (L1), module Superstar II, antenna GPS-600

Nowstre



SIMULATORS CENTRE



FLIGHT SIMULATOR AND TRAINER TL-410M



VISUALIZATION SYSTEM FOR AIR TRAINING DEVICES



MULTI PURPOSE UNMANNED AIRCRAFT M-6 "ZHAYVIR"



Specifications:





Wingspan, m - 1,6; Commercial payload, kg – up to 7; Takeoff mass UAV, kg – up to 10 Engine power, kW – 1,7; Max. speed, km/hour -160; Effectiveness, ha/hour – 40-45; Max. flying height, m – up to 1000; Min. flying height, m – 1,5; Launch technique – ejection; Landing technique – ordinary or parachute; Flight duration, hour - 1,0; Max. distance in automatic mode, km – 10; Max. distance in manual control mode, km - 0,8.



















M-7 "SKY PATROL"





Wingspan, m - 4,0; Commercial payload, kg – up to 25; Takeoff mass UAV, kg – up to 10 Engine power, kW – 2-6; Max. speed, km/hour -192; Flight duration, hour - 5,0; Max. flight altitude, m – up to 3000 Landing speed, km/hour – 63; Length in operative position, m - 3,6; Height with empennage, m - 1,52; Launch technique – ejection or gear; Landing technique – ordinary or parachute; Max. distance in automatic mode, km – 400; Max. distance in manual control mode, km - 1.

Performance specifications:





«Sky patrol M-7» is two-engined aircraft of normal chart with the highly placed wing.



Modern polymers are used to manufacture this type of aircraft







3. Environment protection

3 scientific – research centers

CENTER OF ECOLOGICAL PROBLEMS OF AIRPORTS

- Development of ecological maps includes:
- areas of limitation of building are from the terms of aviation noise
- a sanitary-hygienic area is from the terms of contamination of atmospheric air
- areas of limitation of building are from the terms of electromagnetic radiations
- areas of public safety are from the terms of risk of the third party



4. Information technologies and protection of information

6 scientific – research centers and laboratories

INTERPRETATION, DECODING AND MODELLING OF THE AIRCRAFT INCIDENTS





The computer system for the aircraft incident modeling with 3D-graphic images, synchronous reproduction of the parametrical and speech information has been developed.

NAU SCIENTIFIC RESEARCH PUBLICATIONS



