

FSAMP

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Flight safety and airworthiness –
a masters programme



**Steering committee for the Erasmus+ project
«Flight safety and airworthiness – a master's
programme»**

**561989-EPP-1-2015-1-UK-EPPKA2-CBHE-JP-
ERASMUS + CBHE**

Moscow

8-10th June 2017

Project steering committee 8-10 июня			
	Time	Issue	Expected result
Thursday: 8th June	1030-1130	Presentation and discussion on programme structure and role of Flight safety portal	Joint understanding of programme structure and role of portal as introduction to agreeing the Full description of module.
	1130 - 45	Coffee break	
	1145 - 1400	Working groups for developing modules in first block – presentation of module short descriptions 1: Introduction to the aviation sector including business economics and legislation – Giuliano to lead. 2: Management systems for the aviation sector – David and Suitberto to lead 3: Human factors – Paul to lead	Presentation of module short descriptions and agreement Agreement of Intended learning outcomes Agreement on course content (lectures) Teaching, learning and assessment strategy Plan for production of teaching materials Draft module description is attached.
	1400-1500	Lunch	
	1500-1600	Presentation on the processes of programme approval and management – Peter Reports from partners on plans for programme delivery and discussion on the process of programme launch	Develop the principles of “Agreement on Programme delivery»
	1600-1620	Coffee break	
	1620-1800	Work groups: 1: Establishing the programme committee and processes of joint recognition 2: Developing the approach to project work	Agreement of structure of programme committee and principles of joint recognition and project work.
	Friday 9th June		
Friday 9th June	0900-1100	Working groups for developing the profiles – presentation of the content of profiles 1: Airworthiness - Giuliano to lead 2: Flight operations - Suitberto and David to lead	Discussion and agreement on content of the modules in the Block 2 profiles: Short course descriptions
	1100-1130	Coffee break	
	1130-1300	Continuation of work of working groups	
	1300-1400	Lunch	
	1400-1530	Working groups: 1: Marketing and promotion 2: Project results dissemination plan	Development of plans for marketing and promotion of the programme and project dissemination plan.
	1530-1600	Coffee break	
	1600-1700	Working groups for selective modules	
	1700-1800	Reports on work of Working groups. 1: Course committee structure	Approval of plans of working groups

		2: Principles of joint recognition and project work 3: Marketing and programme promotion 4: Project dissemination plan	
	1900	Dinner	
Saturday 10th June	0900-1100	Review of previous minutes and events Planning visits of EU lecturers to Uzbek and Russian Universities	Approval of plan
	1100-1130	Coffee break	
	1130-1300	Planning production of training material Finance account Closing comments	Approval of plan

Minutes of Steering Committee Number 3 of ERASMUS+ FSAMP Project

561989-EPP-1-2015-1-UK-EPPKA2-CBHE-JP - ERASMUS+ CBHE

27-28th October 2016.

Held at the National University of Uzbekistan in Tashkent.

- Preliminary agenda attached (Appendix A).
- Attendance list attached (Appendix B).
- All presentations will be available on the website and the project's "one drive".

Meeting was opened at 14.30 by Otabek Zhumaev, Vice-Rector of the National university of Uzbekistan.

The following items were discussed:

1: Presentation on the work of the National University of Uzbekistan by Anzirat Nigmatdhanova.

2: Presentation on the work of the Tashkent State Technical University by Nuriddin Abdujabarov. Nuriddin reported that "Aviation safety" had been maintained in the Ministry of Education's list of categories accepted as subjects for university study.

3: Minutes of previous meetings – the minutes of the Stakeholder conference 12th May 2016 and Project steering committee 13th May 2016 were approved.

4: Report on the requirements for the development of the masters programme in Flight safety and airworthiness: Following a presentation outlining the key features of the report by David Campbell and some discussion on the conclusions, the report was accepted with the following amendments:

- i) **"Core competencies of graduates"** should not require, but recommend graduates to have English language skills, there should be specific demands for English skills in certain modules;
- ii) **"Masters programme entry requirements"** should be amended to:

Students entering the masters programme shall have completed either

- a Bachelor level programme (grade 4 or 5) in an approved programme relevant to one of the fields of aviation and/or aeroengineering;
- a Bachelor level programme (grade 4 or 5) in Management or Quality management with relevant experience in the aviation sector;
- ~~the first four years of~~ a specialist programme in one of the fields of aviation and/or aeroengineering.

It was also pointed out that Russian rules require Masters programmes to be open to anyone holding a Bachelor degree, however individual HEIs have the right to establish their own criteria for acceptance onto programmes.

- iii) **“Adaption to professional development courses”** should be expanded to explain that in Russia, it is not normally possible for a person just having work experience without an earlier degree to enrol on a masters course. Normally such a person would participate in professional development courses. It was therefore decided that when developing the modules for the Masters’ programme, courses that could be offered as professional development should also be identified.

5: Presentation by representative of Erasmus+ in Uzbekistan: Kudratkhon Bahadirov gave a presentation on the current plans of Erasmus+, including the recently announced deadlines for the next round of projects, which include:

- Erasmus Mundus Joint Master Degrees 16th February 2017
- Mobility of individuals in the field of education and training 2nd February 2017
- Capacity building in the field of higher education 9th February 2017

Day 1 closed at 1800.

Day 2: The meeting opened at 0915.

Nuriddin Abdujabarov presided.

6: The project site was presented by Petr Kuznetsov. The site address is <http://erasmusfsamp.org>.

The following actions were agreed:

- a: Partners will submit any useful materials for the site;
- b: Partners will submit a list of persons who should have access to the closed forum together with their e-mail addresses to David Campbell.

7: A discussion was held on the proposed contents of the previously decided modules based on the following presentations:

- On the business of aviation by Giuliano Coppotelli;
- On management systems in aviation by Leonid Fedotov and Aleksey Olenev;
- On airworthiness by Yuri Kiselev;
- On meteorology by Bakhtiyar Kholmatjanov.

An outline of a module on human factors was also available but needs developing.

During the discussion the following points were made and in general agreed:

- Many of those who participate in the programme will already work in organisations having policies and documented systems. Given the limited hours of the programme, emphasis should not be on too much detail, but in the practical application of the methods of FSMS;
- For each module, there should be clearly defined learning outcomes;
- The business aviation and legislation modules should be coordinated to avoid overlap, between them they should provide the student with an understanding of the need to balance different interests when managing flight safety within the constraints of legislation and the contradictions between economic interests and safety;
- There should be material included on the costs of safety to allow for an understanding of acceptable levels;
- Each module should be designed so that the key issues are covered within the time restraints of the programme;
- Care should be taken in each module to ensure that a balanced and even approach to the content is used to ensure that all the key issues in the module are covered, without too much emphasis being put on one element at the expense of others (examples: balance between initial and continued airworthiness, emphasis on the risk management, monitoring and safety promotion aspects of management systems);
- Special attention should be paid to risk management systems including ISO 31000;
- Safety management systems, including the use of statistics, should be treated not as formal documents but as instruments to improve safety levels;
- Accident investigation methods should be included at some level;
- All modules should aim to relate their core content to examples of their practical application, maybe using case studies.

The following actions were agreed:

a: One-page summary documents for each module should be produced. David Campbell to produce a model summary by 11th November. Those responsible for each module to produce their summaries by 12th December. These modules to be coordinated and discussed at a skype meeting in third week of December. David Campbell to convene meeting.

8: Plans for the visits of Uzbek and Russian staff members and for EU staff to the partners were discussed.

The following actions were agreed:

a: Staff from Russia and Uzbekistan (4 persons from each partner – 24 in all) will visit Valencia for 1 week in April, London for 1 week in May and Rome for 1 week in June.

b: EU partners will compile suggestions for issues to be covered during these visits by 12th December. Uzbek and Russian partners will also define their wishes for discussion and agreement at the December skype meeting.

c: All names and details of participants in these visits to be sent to David Campbell by 1st March 2017 to arrange visas and travel.

d: Visits by EU staff to the Uzbek and Russian partners can begin as convenient. Each side should consider what could be offered by visitors and coordinated with the needs of the partners. David Campbell to coordinate.

9: Plans for the purchase of equipment were discussed based on the written report and presentation by David Campbell. It was agreed that the general approach outlined in the report should be followed with priority given to the purchase of a system that will be of equal use to all partners. If any money remains in the budget, this could be used to buy individual items of equipment for the partners.

The following actions were agreed:

a: A technical specification will be defined and discussed with partners for presentation and agreement at the December skype meeting. David Campbell responsible.

10: Next meetings – it was agreed that a skype meeting would be held in December and that the next Steering Committee would be brought forward to April 2017, possibly in Valencia to coincide with the staff visit to Spain. The next meeting to discuss practical projects and research aspects of the programme and programme launch plans. Responsible for convening – David Campbell.

11: Meeting closed: Peter Barrington closed the meeting at 1700 with thanks to the National University of Uzbekistan and the Tashkent State Technical University for their work in organising the meeting.

List of participants in steering committee 27-28th October Tashkent

Name	Name in Russian	Institute	Position
Avaz Rakhimovich Marakhmiov	Марахмиов Аваз Рахимович	National University of Uzbekistan	Rector
Otabek Zhumaev	Жумаев Отабек -	National University of Uzbekistan	Project coordinator
Bakhtiyar Kholmatzhanov	Холматжанов Бахтияр	National University of Uzbekistan	Senior lecturer in Dept of "Astronomy and Atmospheric physics"
Anzirat Nigmatdzhanova	Нигмаджанова Анзират	National University of Uzbekistan	Project manager at NUUZ
Farkhod Khamidullaevich Rizaev	Ризаев Фарход Хамидуллаевич	Tashkent State Technical University	Rector
Dmitrii Viktorovich Bystrov	Быстров Дмитрий Викторович	Tashkent State Technical University	Head of International department
Nuriddin Anvarovich Abduzhabarov	Абдузжабаров Нуриддин Анварович	Tashkent State Technical University	Coordinator of working group
Tulkun Akhmadzhanovich Sagdiev	Сагдиев Тулкун Ахмаджанович	Tashkent State Technical University	Head of department
Dzhakhangir Abduvalievich Islamov	Исламов Джахангир Абдувалиевич	Tashkent State Technical University	Senior lecturer
Peter Barrington	Питер Баррингтон	Kingston University	Head of school of aerospace engineering
Paul Wagstaff	Пол Вагстафф	Kingston University	Senior lecturer and consultant School of aerospace engineering
Giuliano Coppotelli	Джулияно Коппотелли	University of Rome (La Sapienza)	Director of programme for aerospace structures
Andres Carrion Garcia	Андрей Каррион Гарсиа	Polytechnical university of Valencia	Director of the centre of quality and change management
Elena Vasquez Barrachina	Елена Васквез Баррачина	Polytechnical university of Valencia	Centre for quality, professor of statistics and operations.
David Campbell	Дэйвид Кэмпбелл	Kingston University	Dept of aerospace engineering, project manager
Iurii Kiselev	Киселев Юрий Витальевич	Samara University	Senior lecturer Dept of the use of aviation technology
Petr Kuznetsov	Кузнецов Петр Анатольевич	Far Eastern Federal University	School of economics and management, director for development
Iuliia Kuznetcova	Кузнецова Юлия Геннадьевна	Far Eastern Federal University	Head of design office in School of engineering
Leonid Fedotov	Федотов Леонид Викторович	Ulyanovsk Institute of Civil Aviation	Head of scientific research
Alexey Olenev	Оленев Алексей Анатольевич	Ulyanovsk Institute of Civil Aviation	Vice rector for investment and innovation

Year 1: Aviation safety	Introduction to the aviation sector	Business economics for the aviation sector	Law and aviation sector	Human factors
	Management systems for the aviation sector			
	Profile 1 Flight safety and operations		Profile 2 Airworthiness and certification	
	Common elective modules: 1: Air navigation; 2: Meteorology; 3: Fuel systems and supply; 4: Investigation of incidents and accidents; 5: Security; 6: Data collation and analysis; 7: Inspections and audits; 8: Managing change			For profiles 1: Airworthiness; 2: Flight safety and operations; 3: Airport management



<p>Title of module: “Introduction to the aviation business” Programme: “Flight safety and airworthiness” Level: “Masters” – EQF Level 7 ECTS value: 6 credits</p>	
<p>Module summary</p>	<p>The training of competent specialists in the field of flight safety systems is a complex task, requiring the development of a number of skills and competences linking aircraft construction and operations as well as the analysis and monitoring of results achieved.</p> <p>Specialists however have to work within the constraints set by the business aspects of aviation and within a strict regulatory framework.</p> <p>The aim of this module is to provide students with knowledge and understanding of the modern business and regulatory environment allowing them to move on to develop a more deeper understanding of flight safety management systems and their application through lectures and seminars and teaching them to apply this knowledge using practical case studies and problem solving exercises using real data from the field of flight safety management systems.</p>
<p>Relationship of module to other modules</p>	<p>The module «Introduction to the aviation business» is a compulsory part of the masters programme, studied at the beginning of the course. It may, if deemed necessary be delivered in three separate courses – principles of flight, the aviation business and legislation.</p> <p>Pre-requisites: Entry to the module is accepted providing the general requisites for entry to the full programme are met.</p> <p>Co-requisites: None.</p>
<p>Module aims</p>	<p>The aim of this module is to provide students having different cultural backgrounds with a common basic knowledge and understanding of the principles of flight, the aviation business and legislation which are required to allow the student to further his or her studies in the field of flight safety management systems.</p>
<p>Intended learning outcomes</p>	<p>On successful completion of the module, students will be able to:</p> <ol style="list-style-type: none"> 1: resolve typical problems in aerodynamics, propulsion, structure, and systems and understand the role of air traffic control and avionics; 2: interact with design, maintenance, and service engineers operating in civil aviation and pro-actively implement procedures consistent with the flight aviation authority regulations; 3: understand and develop the main elements of a business plan for a company in the aviation sector and apply this knowledge to develop a business plan; 4: conduct studies of the economic impact of safety measures;

	<p>5: demonstrate the ability to fulfill the preliminary work to obtain, maintain and operate licenses;</p> <p>6: understand and communicate national and international regulations in the field of flight safety.</p>
<p>Short description of curriculum content</p>	<p>Introduction to civilian aircraft: The classification of civilian aircraft and their main characteristics;</p> <p>Principles of civilian aircraft design: Analysis of load environment and flight envelope, the design principles applied when dealing with aerodynamics, aeronautical engines, aeronautical structures, aeronautical materials, flight mechanics, control systems, and avionics;</p> <p>Civilian aircraft performance: Main methodologies for the analysis of aircraft engineering performance and criteria for aircraft sizing. The numerical methods belonging to the different disciplines are outlined. Performance testing. Stability and control testing.</p> <p>Aircraft safety assessment: Principles and techniques of aircraft safety assessment.</p> <p>Introduction to aviation economics: Basic elements of aviation economics and studies, their relationship to airport handling responsibility, air and land side, route planning, crew, fuelling, maintenance and parts support. security, advertising and promotion, ATC, economic resources, business planning and monetary resources;</p> <p>Airline finances: Introduction to the financial and operative leasing, wet or dry lease, direct purchase, fleet planning and acquisition costs, international air fares and ICAO's policies, public service obligations;</p> <p>Operating licenses: Introduction to operating licenses, interaction between the flight authority and aircraft operator, handling leasing for aeronautical companies, main requirements for the issue of operating licenses.</p> <p>Business economics and impact on safety: Public policy, deregulation and low cost carriers, costs of safety and acceptable levels, economic impact studies.</p> <p>Basics of aviation legislation Understanding the regulation of aviation rights, methods of realizing aviation rights, the hierarchy of aviation legislation, the legal basis for the state regulation of civil aviation activities, the main methods of regulating these activities, the legal regime for the use of air transport, the regulative base determining procedures for the use of air space.</p> <p>The regulation of the management of flight safety Main elements of the aviation-transport system, their legal status, the specifics of the legal regulation of flight safety, the legal regulation of air transport and the activities of aviation organisations, the organization-legal basis of the management of flight safety, modern conceptions of flight safety, assessing the activities of aviation organisations from the point of view of assuring flight safety.</p> <p>Technical regulation of airports and aircraft</p> <p>The regulation of transport security The legal assurance of activities for the prevention of illegal intervention in the activities of civil aviation, an understanding of transport security, aviation security, conceptions for assuring transport safety.</p>

	<p>International legislation International aviation rights, the legal basis of the operation of international aviation organisations for assuring the safety of air transport, sources and principles of the formation of international aviation legislation, international organisations involved in civil aviation.</p>		
<p>Teaching and learning strategy</p>	<p>The module is delivered using a combination of lectures, seminars and guest presentations to cover the main elements of the curriculum in a three week-long blocks followed by guided reading and study, supplemented by seminar-workgroups. Emphasis is placed on using actual case studies and information/data from the aviation sector using the databases and materials from the Flight safety portal.</p> <p>Teaching notes, webinars, reading materials, data-bases for problem solving and other supplementary materials will be available on the Flight safety portal.</p> <p>Students will be expected to spend a total of 216 hours on the module including independent study. As a guide this may involve:</p>		
	<p>Scheduled learning and teaching</p>	Lectures	45 hours
		Case studies and practical tasks	30 hours
		Webinars/tutorials	30 hours
	<p>Guided independent study</p>	Guided reading and study	30 hours
Development of business plan		81 hours	
<p>Assessment strategy</p>	<p>Knowledge acquired during lectures will be assessed using short tests at session end. Two practical tasks implemented by individuals will be assessed based on written submissions. At the end of the course, the student will be assessed based on a formal presentation of their results of developing a business plan during which the results achieved and the transversal skills utilized during the project are assessed.</p> <p>Feedback during the module given through group discussion, workshop and tutorial sessions as well as actual assessments to enable the students to develop an awareness of their rate and level of progress, their strengths and weaknesses in the subject area and support students in preparing for their final assessments.</p>		
<p>Map of learning outcomes to assessment strategy</p>	Learning Outcome	Assessment strategy	Percentage weighting
	1: resolve typical problems in aerodynamics, propulsion, structure, and systems and understand the role of air traffic control and avionics	Results of tests after lectures	10%
	2: interact with design, maintenance, and service engineers operating in civil aviation and pro-actively implement procedures consistent with the flight aviation authority regulations;	First coursework – 4000 words	10%
	4: conduct studies of the economic impact of safety measures;	Second coursework – 4000 words	20%

	5: demonstrate the ability to fulfill the preliminary work to obtain, maintain and operate licenses; 6: understand and communicate national and international regulations in the field of flight safety.	Second coursework – 4000 words	20%
	3: understand and develop the main elements of a business plan for a company in the aviation sector and apply this knowledge to develop a business plan;	Formal presentation of their results of business planning exercise	40%
Achieving a pass requires that at least 50% is achieved in each category and overall 60%.			
Bibliography	Core texts: To be defined		
	Recommended reading: Materials on Flight safety portal.		



<p>Title of module: “Management systems in the aviation sector” Programme: “Flight safety and airworthiness” Level: “Masters” – EQF Level 7 ECTS value: 8 credits</p>	
Module summary	<p>The modern approach to aviation safety is holistic, with strong pro-active, evidence-based, aviation safety activities requiring a systematic approach to managing the machine-human-environment relationships required to ensure the reliability of aircraft construction, the competence of pilots and traffic management staff, the quality of ground handling and airport services, the way in which security services combat terror threats, the way in which cabin crew deal with air-rage.</p> <p>International oversight bodies including the International Civil Aviation Organisation, the European Aviation Safety Agency and the Federal Aviation Authority now require that these issues are dealt with by implementing “Safety Management Systems”. Such systems require a change in mind set, away from traditional compartmentalised training emphasising technical solutions to the use of a formal, holistic top-down business approach to managing safety risk by establishing polices, organisational structures and accountabilities backed by a safety promotion framework and culture.</p> <p>The aim of this module is to support the introduction and development of flight safety management systems by providing students with a theoretical understanding of the principles, benefits and techniques of flight safety and airworthiness through lectures and seminars and teaches them to apply this knowledge using practical case studies and collaborative projects using real data from the field of flight safety management systems.</p>
Relationship of module to other modules	<p>The module «Management systems in the aviation sector» is a compulsory part of the masters programme, studied after the module “Introduction to the aviation business” and “Legislation and regulation in the aviation sector”.</p> <p>Pre-requisites: Entry to the module is accepted providing the general requisites for entry to the full programme are met.</p> <p>Co-requisites: The module requires at least a basic understanding of statistics and ideally should run in parallel with the module on statistics and human factors in aviation.</p>
Module aims	<p>The student knows and understands the main factors that affect flight safety and the interrelationships between them, the different functions of flight safety management systems, the main conceptions of the FSMS of ICAO, EASA and MAK, and are able to choose and apply effective methods for the identification, assessment and management of threats and risks and to critically assess strategies for the</p>

	development and strengthening of the safety culture in organisations, including the role of leadership, structures and monitoring and accountability systems.
Intended learning outcomes	On successful completion of the module, students will be able to: 1: Demonstrate an in-depth understanding of the essential ingredients that affect flight safety and the interrelationships between them; 2: Understand and apply the main elements of management systems in general and flight safety management systems in particular and design and manage such systems in accordance with the requirements of ICAO, EASA and MAK; 3: Identify the possible threats to flight safety and assess the associated risk, establish suitable risk management programmes; 4: Use basic statistics and statistical tools for aviation, data collection and analysis techniques and the essentials of information security and data distribution; 5: Apply the essential techniques of project management to ensure the engagement of other personnel in flight safety management programmes.
Short description of curriculum content	Introduction to management systems in the aviation sector: What is management, quality, safety, principles of ISO 9004. Management systems in aviation, international and national organisations (IATA, ICAO, EASA, FAA, RosAviation, MAK) and their role. Statistics and data management: Basic statistics and statistical tools for aviation, data collection and analysis, information security and data distribution. Risk management: Identifying sources of risk, their categorisation, analysis and managing risks, tools for managing risk, monitoring. ICAO's approach and flight safety: Introduction to the approach of ICAO, State Safety Programs, basic legislation, state systems and their function, resolution of safety problems. ICAO's annexes: Operations, Airworthiness, Navigation and air traffic services, Investigation of incidents and accidents, Aerodromes, Security. Flight safety management systems 1: Role of leadership and safety policies, key personnel, their competences and responsibilities, coordinating activities in emergency situations. Flight safety management systems 2: Managing risks for flight safety, analysing and reducing risk, analysing effectiveness of flight safety, continuous improvement, training, information exchange. Key questions of flight safety: Automation, ground collision in managed flight, landings, resource management, pilot fatigue, flight path monitoring, loss of flight control, flight safety.
Teaching and learning strategy	The module is delivered using a combination of lectures, seminars and guest presentations to cover the main elements of the curriculum in two one week blocks separated by several weeks to allow for guided reading and study. Emphasis is placed on using actual case studies and information/data from the aviation sector using the databases and materials from the Flight safety portal. Following the second week of study students will participate in a collaborative project with other students with the aim of developing transversal skills in the context of flight safety management systems.

	<p>Teaching notes, webinars, reading materials, data-bases for problem solving and other supplementary materials will be available on the Flight safety portal.</p> <p>Students will be expected to spend a total of 288 hours on the module including independent study. As a guide this may involve:</p>		
	Scheduled learning and teaching	Lectures	48 hours
		Case studies and practical tasks	60 hours
		Webinars/tutorials	12 hours
	Guided independent study	Guided reading and study	30 hours
		Problem solving tasks	44 hours
		Collaborative project	94 hours
Assessment strategy	<p>Knowledge acquired during lectures will be assessed using short tests at session end. Two practical tasks implemented by individuals will be assessed based on written submissions. At the end of the course, the team of students participating in the collaborative project will be assessed based on a formal presentation of their results during which the results achieved and the transversal skills utilized during the project are assessed.</p> <p>Feedback during the module given through group discussion, workshop and tutorial sessions as well as actual assessments to enable the students to develop an awareness of their rate and level of progress, their strengths and weaknesses in the subject area and support students in preparing for their final assessments.</p>		
Map of learning outcomes to assessment strategy	Learning Outcome	Assessment strategy	Percentage weighting
	1: Demonstrate an in-depth understanding of the essential ingredients that affect flight safety and the interrelationships between them; 2: Understand and apply the main elements of management systems in general and flight safety management systems in particular and design and manage such systems in accordance with the requirements of ICAO, EASA and MAK;	Results of tests after lectures	10%
		First coursework – 4000 words	20%
	3: Identify the possible threats to flight safety and assess the associated risk, establish suitable risk management programmes;	Second coursework – 4000 words	20%
	4: Use basic statistics and statistical tools for aviation, data collection and analysis techniques and the essentials of information security and data distribution;	Third coursework – analysis and problem solving project – 4000 words	20%

	5: Apply the essential techniques of project management to ensure the engagement of other personnel in flight safety management programmes.	Collaborative project – 1 hour presentation.	30%
Achieving a pass requires that at least 50% is achieved in each category and overall 60%.			
Bibliography	Core texts: To be defined		
	Recommended reading: Materials on Flight safety portal.		



<p>Title of module: “Human factors in aviation sector” Programme: “Flight safety and airworthiness” Level: “Masters” – EQF Level 7 ECTS value: 4 credits</p>	
Module summary	<p>In modern aviation, human factors play a dominant role in part in order to design and manage safe machines and effective management systems as well as being a major contributing factor in almost all aircraft accidents, identified as a causal factor in three out of every four incidents.</p> <p>As a discipline, the study of human factors is seen as increasingly important, playing a critical role in contributing positively or negatively to the levels of aviation safety. Students therefore need to gain an understanding of what Human Factors are, and how aviation operations can be managed effectively, with due recognition of the impact of Human Factors, so as to create a safe and just operating environment.</p> <p>The aim of this module is to provide students with knowledge and understanding of the factors that influence human performance, allowing them to apply tools and methods for the prevention of errors in aviation through lectures and seminars and teaches them to apply this knowledge using practical case studies and problem solving exercises using real data from the field of flight safety management systems.</p>
Relationship of module to other modules	<p>The module «Human factors in aviation safety» is a compulsory part of the masters programme, studied after the module “Introduction to the aviation business” and “Legislation and regulation in the aviation sector”.</p> <p>Pre-requisites: Entry to the module is accepted providing the general requisites for entry to the full programme are met.</p> <p>Co-requisites: The module requires at least a basic understanding of the aviation business and management systems in the aviation sector and should be studied after these two modules.</p>
Module aims	<p>The aim of this module is to provide students with knowledge and understanding of the factors that influence human performance, allowing them to apply tools and methods for the effective management of teams, the regulation of stress and fatigue and prevention of errors in aviation within the context of increasing automation.</p>
Intended learning outcomes	<p>On successful completion of the module, students will be able to:</p> <ol style="list-style-type: none"> 1: understand the history, theories and main conceptions of human factors in aviation, including the effects of fatigue, stress and individual differences; 2: demonstrate the ability to apply tools and methods for error prediction and measurement in aspects of aviation safety such as crew resource management, human-computer interaction and automation, design, maintenance in order to develop innovative solutions to complex problems;

	3: demonstrate the ability to effectively communicate, including during training and simulation and in the context of a “just” culture measures needed for the effective management of flight safety.													
Short description of curriculum content	<p>Introduction to human factors in aviation: History of human factors in relation to aviation, their influence on safety and efficiency, models for analyzing human factors including SHEL, James Reason, HFACS;</p> <p>Ergonomics in flight safety: User centred design and understanding user tasks, human information processing, situation awareness, mental workload and stress;</p> <p>Team working in a “Just” culture: Team formation and management, leadership, problem solving and overcoming conflict, communications and a “Just” culture.</p> <p>Error prediction Taxonomies of error, tools and methods for error prediction and measurement, practical management of human errors including Hierarchical Task Analysis and SHERPA, workload and fatigue;</p> <p>Managing risk: Risk identification and evaluation using the bow tie analysis, CRM and decision making.</p> <p>Human factors and automation Questions of automation, the human – machine interface, automation and automation surprise, how data is handled, flight path management.</p> <p>Human factors and safety management Human factors and human centred design, human factors and maintenance, human error management and the use of safety tools such as MEDA and HFACS.</p>													
Teaching and learning strategy	<p>The module is delivered using a combination of lectures, seminars and guest presentations to cover the main elements of the curriculum in a week-long block followed by guided reading and study, supplemented by seminar-workgroups. Emphasis is placed on using actual case studies and information/data from the aviation sector using the databases and materials from the Flight safety portal.</p> <p>Teaching notes, webinars, reading materials, data-bases for problem solving and other supplementary materials will be available on the Flight safety portal.</p> <p>Students will be expected to spend a total of 144 hours on the module including independent study. As a guide this may involve:</p> <table border="1" data-bbox="395 1547 1449 1827"> <tr> <td rowspan="3">Scheduled learning and teaching</td> <td>Lectures</td> <td>14 hours</td> </tr> <tr> <td>Case studies and practical tasks</td> <td>30 hours</td> </tr> <tr> <td>Webinars/tutorials</td> <td>14 hours</td> </tr> <tr> <td rowspan="2">Guided independent study</td> <td>Guided reading and study</td> <td>30 hours</td> </tr> <tr> <td>Problem solving exercises</td> <td>56 hours</td> </tr> </table>		Scheduled learning and teaching	Lectures	14 hours	Case studies and practical tasks	30 hours	Webinars/tutorials	14 hours	Guided independent study	Guided reading and study	30 hours	Problem solving exercises	56 hours
Scheduled learning and teaching	Lectures	14 hours												
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Assessment strategy	<p>Knowledge acquired during lectures will be assessed using short tests at session end. Two practical tasks implemented by individuals will be assessed based on written submissions. At the end of the course, the student will be assessed based on a formal presentation of their results of a problem solving exercise during which the results achieved and the transversal skills utilized during the project are assessed.</p>													

	Feedback during the module given through group discussion, workshop and tutorial sessions as well as actual assessments to enable the students to develop an awareness of their rate and level of progress, their strengths and weaknesses in the subject area and support students in preparing for their final assessments.		
Map of learning outcomes to assessment strategy	Learning Outcome	Assessment strategy	Percentage weighting
	1: understand the history, theories and main conceptions of human factors in aviation, including the effects of fatigue, stress and individual differences;	Results of tests after lectures	10%
		First coursework – 4000 words	20%
	2: demonstrate the ability to apply tools and methods for error prediction and measurement in aspects of aviation safety such as crew resource management, human-computer interaction and automation, design, maintenance in order to develop innovative solutions to complex problems;	Second coursework – 4000 words	30%
	3: demonstrate the ability to effectively communicate, including during training and simulation and in the context of a “just” culture measures needed for the effective management of flight safety.	Formal presentation of their results of a problem solving exercise.	40%
Achieving a pass requires that at least 50% is achieved in each category and overall 60%.			
Bibliography	Core texts: To be defined		
	Recommended reading: Materials on Flight safety portal.		



Short description of module “Airworthiness”	
Context in course	The module «Airworthiness» is a compulsory part of the masters programme, studied after the module “Introduction to the aviation business” and “Management systems in the aviation sector”.
Aim of the module	The aim of the module is to provide the student with the knowledge and skills, organizational and technical methods needed for assessing the airworthiness of aircraft and their power-plants in accordance with the requirements of airworthiness standards.
Expected competences	The ability to organize and implement the supervision and control to observe regulatory requirements for the maintenance of airworthiness and ensure flight safety during the use of aircraft; The ability to participate in the procedures for the certification of objects used in aviation technology.
Short description of content	<p>Standards: Historical review and current situation concerning national and international standards, defining responsibilities for airworthiness, the requirements of the norms for airworthiness technical flight characteristics, for structure strengths equipment and exploitation limits;</p> <p>Certification procedures: Procedures for the certification of aviation technology, aircraft type certification, structure of support systems, normative-technical and organisational documents to support airworthiness of aircraft and description of its components, the system for certification of air transport in Russia (CCBT);</p> <p>System of continuing airworthiness: The structure of system for supporting airworthiness of aircraft and description of its components, material and technical provisions for supporting airworthiness, information support for continuing airworthiness.</p> <p>The organisation of state control for supporting airworthiness: Operator and organisation certification for technical servicing and repair of aircraft; Certification of aircraft.</p>
Study methods	Practical lessons with elements of research, the use of computers for calculations and participation in group discussions, the implementation of individual diploma projects of the theme of “Preparation of documents of proof for obtaining (or prolonging) airworthiness certificates for single aircraft (for certifying a service/repair organization).
Assessment methods	Current assessment of students’ knowledge is assessed during study, the results of which determine whether the student can enter or not the final written and oral exam.
Credits/hours	4 ECTS credits, 144 hours (38 hours of lectures and seminars, 16 hours of consultation for diploma project, 54 hours of self-study, 36 hours preparation for exam).



Short description of module «Aviation meteorology»	
Context in course	The Module "Aviation meteorology" is a selective course in the masters programme, studied after the compulsory modules.
Aim of the module	The aim of the module is to provide students with the knowledge and understanding of how physical parameters of the atmosphere affect the performance of aviation technologies and practical methods for predicting and understanding weather conditions with the aim of increasing the safety, regularity and economic efficiency of flights.
Expected competences	<p>The student knows and understands the basic conceptions of general and synoptic meteorology, methods of ground and air observation as well as methods of atmospheric investigation from space;</p> <p>He knows the main flight -technical characteristics of aircraft used in modern civil aviation and the effect on them of meteorology quantities and weather events, the procedures and content of the meteorological assurance of civil aviation and regulatory documentation;</p> <p>He is capable of analyzing complex aerosynoptic material, is able to issue meteorological documentation, assess the possible of complicated meteorological events or dangerous flight conditions occurring, is able to quickly assess any special meteorological conditions that affect flight safety.</p>
Short description of content	<p>Introduction to aviation meteorology: The current state and perspectives for development of aviation meteorology, international cooperation for the meteorological assurance of flights, real and standard atmospheres, basic information about the atmosphere, a standard atmosphere and its thermodynamic parameters, variations of real conditions from the norm;</p> <p>Physical characteristics of the atmosphere: Physical characteristics of the atmosphere (meteo-values and meteo-events), air temperature, atmospheric pressure, humidity and air density, baric field, winds, weather as a combination of physical characteristics;</p> <p>Weather effects on flight: The influence of atmospheric physical parameters of flights, on take-offs and landings, maximum flight speeds, climb rates and ceilings, elements of dynamics and thermodynamics, atmospheres, wind and its characteristics, effect of wind on civil aviation, adiabatic processes in the atmosphere, water condensation in the atmosphere, its influence on flight, condensation and sublimation of water in the atmosphere, fog, mist, clouds, precipitation and their effects on flight, synoptic processes and their effect on flight, air masses, baric formations, atmospheric fronts.</p> <p>Aviation forecasting: Aviation forecasting, forecasting synoptic situations, assessing the accuracy of aviation weather forecasts, meteorological events dangerous for flight, the peculiarities of weather at height and in geographical situations, flight conditions at low level and at height, in mountainous and valley regions, over water surfaces, meteorological codes, weather maps, vertical slicing of atmosphere, aviation meteorological codes METAR/TAF, aerosynoptic materials;</p>

	<p>Weather services: General organization of the meteorological support for civil aviation, aviation weather bodies, meteorological equipment, setting up meteorological equipment in airports for civilian use, meteorological observations, general requirements for weather observations and bulletins, meteorological services of the Warsaw agreement for aircraft; Incidents and accidents caused by the poor organization of meteorological services.</p>
Study methods	The student participates in lectures, webinars and practical study, uses computers for the calculation of parameters, independently studies practical problems and joint projects and participates in group discussions.
Assessment methods	Verbal (collective) presentations, results of practical tasks.
Credits/hours	The module is worth 3 credits (ECTS) and lasts 108 hours (lectures – 20 hours, webinars 20 hours, studying practical tasks 20 hours, seminars 10 hours, independent study and joint projects –38 hours.



Short description of module «Information systems for aviation safety»	
Context in course	The module «Information systems for aviation safety» is an elective discipline in the masters programme for “Flight safety and airworthiness”.
Aim of the module	The aim of the module is to provide knowledge and understanding of the role of information systems in the various aspects of aviation safety, provide practical experience of their use as well as in developing systems for the management of information security and cyber-security.
Expected competences	The student knows and understands the role and capabilities of the various information systems used in civil aviation, is capable of identifying the key issues in their use that may affect aviation safety, is able to design and implement an information security management system to protect data and its use in aviation and is capable of applying the principle methods of cyber-security.
Short description of content	<p>Information systems in aviation Types of information systems and their use in manufacturing, airport/airline operations, strategy implementation at national and organization level, ATC and navigation, aircraft operation, communications, data intelligence and analysis including in incident and accident investigations;</p> <p>Management systems for information security Sources of risk, introduction to ISO 27000 standards, scope and structure, developing the risk management plan, IS best practices;</p> <p>Cyber-security The cyber-security framework, standards, establishing the cyber-security culture, the threat management methodology, protection of threatened elements, communications incident response, cyber-security in design and operations.</p>
Study methods	Lectures, practical exercises and seminars with group task solving.
Assessment methods	On-going assessment of students’ knowledge based on testing, the results of such assessment give the students the proper feedback for the final examination based on written and oral questions.
Credits/hours	The module is worth 2 credits (ECTS) and lasts 72 hours (18 hours of lectures and seminars, 45 hours of independent work, 9 hours assessment).



Short description of module «Psychological testing of flight crews»	
Context in course	The Module "Psychological testing of flight crews" is a selective course in the masters programme, studied after the compulsory modules.
Aim of the module	The aim of this module is to provide students with the knowledge, ability and skills to conduct assessments of the psychological state of flight crew and service personnel and their suitability for airworthiness, suitability for technical and service tasks in accordance with the requirements of flight safety.
Expected competences	The student is able to organize and conduct supervision and control for the implementation of state requirements for the maintenance of airworthiness and assuring the safety of flights when using aviation technology; Is able to conduct work to control the psychological state of the flight crew to allow them to fly; Is able to participate in procedures for revealing persons preparing to break rules of conduct terrorist acts.
Short description of content	A review of the historical and current situation with national and international standards and regulations in the sphere of crew airworthiness, defining responsibilities of flight crew and service personnel, psychological types and factors affecting a person's psychological state, description of means and methods for controlling psychological states, description of how to conduct control of the psychological state, description of the rules allowing flight crew and service personnel to work.
Study methods	Student participates in practical exercises with elements of the competence approach and methods of active study, using technical instruments for the diagnosis of the psychological states of persons.
Assessment methods	Work is assessed during the course, using tests, the results of which are used to define whether a student is allowed into the final exam, consisting of written and oral questions.
Credits/hours	ECTS 2 – 72 hours.



Short description of module «Reliability and aircraft resources»	
Context in course	The module “Reliability and aircraft resources” is an elective discipline in the masters programme “Flight safety and airworthiness”
Aim of the module	The aim of the module is to provide knowledge and understanding in the field of assurance of technical reliability, safety and resources of the elements of aircraft construction and power units in accordance with the requirements of the norms of airworthiness at all stages of the aircraft life cycle.
Expected competences	The ability to use a deepened understanding of the methods of assuring technical and strength reliability, resources and safety of the elements of construction of aircraft during their design, production and use and their influence on the implementation of state requirements for maintaining airworthiness and assuring flight safety during the use of aircraft and the certification of objects of the technical exploitation of aircraft.
Short description of content	Reliability parameters for technological systems, the time between failure function, practical methods for calculating the time to failure with varying combinations of actual and boundary conditions for the functional parameters of technological systems, estimating reliability under standard and non-standard loadings for aircraft, statistical methods as a basis for parameters of reliability as a result of failures and testing of elements of the construction of aircraft. Examples of the calculation of reliability and resources.
Study methods	Lectures, practical exercises and seminars with elements of research, the use of computers and standard calculation programmes.
Assessment methods	On-going assessment of students’ knowledge using oral examination.
Credits/hours	The module is worth 2 credits (ECTS) and lasts 72 hours (18 hours of lectures and seminars, 36 hours of independent work, 18 hours assessment).



Short description of module «Statistical methods for the analysis of test results and failures of aviation technology»	
Context in course	The module «Statistical methods for the analysis of test results and failures of aviation technology» is an elective discipline in the masters programme for “Flight safety and airworthiness”.
Aim of the module	The aim of the module is to provide knowledge and understanding in the field of the collection, processing and analysis of statistical data obtained during laboratory and in-situ tests of elements of aircraft construction as well as during aircraft use.
Expected competences	The ability to use statistical methods for the estimation of reliability and resource lifetime parameters in laboratory and in-situ conditions with static and variable loading of the power sources in aircraft construction.
Short description of content	Statistical methods for estimating random variables as a result of sampled populations, complete and incomplete (census and partial census) sampling, reasons and consequences of their formation during the analysis of the failure of elements of aircraft construction, methods of processing such samples (maximum likelihood and least squares), Confidence in estimating parameters, quantile distribution of random parameters during censuses, and estimating guaranteed resources of critical aircraft parts, criteria for confirming statistical hypotheses, used in the analysis of laboratory and in-situ testing and the failure of aircraft parts, non-parametrical criteria and stable (robust) procedures, specifics and processing the results of material fatigue tests and elements of aircraft construction in direct and indirect (constructing fatigue curves and the distribution function for boundary breakdowns) tests.
Study methods	Lectures, practical exercises and seminars with elements of research, the use of computers and standard calculation programmes.
Assessment methods	On-going assessment of students’ knowledge using oral examination.
Credits/hours	The module is worth 2 credits (ECTS) and lasts 72 hours (18 hours of lectures and seminars, 36 hours of independent work, 18 hours assessment).

Planning courses for the second part of year

Subject	Length of seminar/course	Person delivering
FOR EXAMPLE		
Introduction to Flight Management Systems		
SUGGESTIONS		
Introduction to aviation safety - principles of flight		
Business economics for aviation		
Regulation of flight security		
International regulation of flight safety		
Introduction to management systems in the aviation sector		
Flight safety management systems		
ICAO's approach and flight safety		
Risk management		
Statistics and data analysis for flight safety		
Introduction to human factors in aviation		
Sociology and psychology for flight safety		
Error prediction		
Human factors and automation		
Human factors and safety management		
Airworthiness -initial		
Airworthiness - continuing		
Aviation meteorology		
Information systems in aviation		
Management systems for information security		
Cyber-security		
Common mode failures, Fault tree analysis, dependence diagrams and Boolean algebra for quantification of system reliability, Reliability analysis using Weibull distribution, Zonal safety analysis (ZSA) and Particular Risk Analysis (PRA), Failure Mode and Effect Analysis (FMEA)		
Airworthiness and power supplies		
Airworthiness and radionics		
Statistics used in assuring airworthiness		
Flight safety and operations		
Airports and flight safety		
Staff training and flight simulation		
Aviation fuel for flight and operations		
Statistics and flight safety		
Air traffic control and navigation;		
Accident investigation		
Change management		
Drones and aviation safety		
Inspections and audits		
EQAR guidelines		
Quality assurance of the education process		
The use of ICT in higher education		