



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Human Reliability in Aviation

### Course

Field of study

Aviation

Area of study (specialization)

Air Traffic Management

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

3/5

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

### Number of hours

Lecture

30

Laboratory classes

15

Other (e.g. online)

0

Tutorials

15

Projects/seminars

0

### Number of credit points

5

### Lecturers

Responsible for the course/lecturer:

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Responsible for the course/lecturer:

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### Prerequisites

Knowledge: Basic knowledge of transport safety, basic knowledge of air transport

Skills: the ability to solve research problems using scientific methods the ability to find cause-and-effect relationships based on the acquired knowledge

Social competences: the ability to precisely formulate questions; the ability to define priorities important in solving the tasks set for him; the ability to formulate a research problem and search for its solution, independence in problem-solving, the ability to cooperate in a group.

### Course objective

1. To acquaint students with the basic concepts of the impact of the human factor on the safety of air transport



2. Acquainting students with the possibilities and limitations of the pilot, in particular with the occurring diseases, illusions, elements of physiognomy
3. Introducing students to the methods and means for testing the psychophysical abilities of pilots, in particular flight simulators, reaction time meters, electroencephalograph, etc.
4. Improving students' skills in defining and solving research problems
5. Indication of the essence of human predisposition to perform functions in air transport: pilot, aircraft crew, cabin crew

### Course-related learning outcomes

#### Knowledge

1. has ordered and theoretically founded general knowledge in the field of key technical issues and detailed knowledge of selected issues related to air transport, knows the basic techniques, methods and tools used in the process of solving tasks related to air transport, mainly of an engineering nature [L1\_W03]
2. the student has knowledge of aviation safety and management. The student knows the concept of the human factor and methods of assessing human reliability, has detailed knowledge related to selected issues in the field of human capabilities and limitations during aircraft operation in flight, its impact on health and the ability to perform air operations, as well as the possibility of improving the physical condition [L1\_W14] .

#### Skills

1. is able to obtain information from various sources, including literature and databases, both in Polish and in English, integrate them properly, interpret and critically evaluate them, draw conclusions and exhaustively justify their opinions [L\_U01]
2. can properly use information and communication techniques, applicable at various stages of the implementation of aviation projects [L\_U02]
3. can properly plan and perform experiments, including measurements and computer simulations, interpret the results obtained, and correctly draw conclusions from them [L\_U03]
4. can, when formulating and solving tasks related to civil aviation, apply appropriately selected methods, including analytical, simulation or experimental methods [L\_U04].

#### Social competences

1. understands that in technology, knowledge and skills very quickly become obsolete [L\_K01]
2. is aware of the importance of knowledge in solving engineering problems, knows examples and understands the causes of malfunctioning engineering projects that have led to serious financial and social losses, or to a serious loss of health and even life [L\_K02].5. Abc.



### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

LECTURE: Assessment of knowledge and skills in a written or oral exam based on the explanation of selected issues.

TUTORIALS: Final test covering the issues discussed during the exercises

LABORATORY: Current assessment of student's activity in class, preparation and evaluation of student reports after each class.

### Programme content

LECTURE:

Classification and quantitative structure of errors made by a human / operator / pilot.

Analysis of selected sources of threats as factors escalating human errors in air transport systems.

Methodology of human reliability analysis (HRA) - description of methods with examples.

Selected issues in physiology;

Selected issues in psychology;

Psychophysical burdens at workplaces;

Psychosocial risk related to the performed profession;

Theories of the formation of air accidents.

Pilot errors, taxonometry of errors, examples of events caused by pilot errors.

Methodology of examining the psychophysical state of a pilot.

TUTORIALS

1. Indicators of human reliability

2. Methodology of human reliability analysis - exercise in groups

3. Analysis of air accidents

4. Attitudes of the pilot-in-command

5. Test

LAB:

1. Introduction to the topic of classes and health and safety rules



2. Assessment of the psychophysical condition of aviation personnel on the basis of the parameters of the cardiovascular system
3. Assessment of the rate of human reaction using the Piórkowski Apparatus
4. Assessment of the rate of human reaction using the Reaction Parameters Meter
5. Using eyetracking to analyze the perception of on-board instruments
6. The impact of the performance of tests supporting concentration on the psychophysical state of a human being
7. Test

### Teaching methods

Informative (conventional) lecture (providing information in a structured manner) - may be of a course (introductory) or monographic (specialist) character

The exercise method (subject exercises, practice exercises) - in the form of auditorium exercises (application of acquired knowledge in practice - may take various forms: solving cognitive tasks or training psychomotor skills; transforming a conscious activity into a habit through repetition)

Laboratory (experiment) method (students independently conduct experiments)

### Bibliography

Basic

1. Lozia Z., Symulatory jazdy samochodem, WKŁ, Warszawa 2008
2. Makarowski R., Smolicz T., Czynniki ludzkie w operacjach lotniczych, ADRIANA AVIATION, Kosowizna, 2012
3. Lewitowicz J., Kustroń K., Podstawy eksploatacji statków powietrznych, Własności i właściwości eksploatacyjne statku powietrznego, Wyd. ITWL, Warszawa, 2003
4. Zagdański Z., Stany awaryjne statków powietrznych, Wyd. ITWL, Warszawa, 1995

Additional

1. Podręcznik zarządzania bezpieczeństwem, Doc 9859 ICAO Organizacja Międzynarodowego Lotnictwa Cywilnego, wydanie pierwsze 2006
2. Romanowska-Słomka I., Słomka A., Zarządzanie ryzykiem zawodowym. Wydawnictwo Tarbonus, Tarnobrzeg, 2005
3. Lewitowicz J. (red.) Podstawy eksploatacji statków powietrznych, Badania eksploatacyjne statków powietrznych, Wyd. ITWL, Warszawa, 2007
4. Domicz J., Szutowski L., Podręcznik pilota samolotowego, Wyd. Technika/Aerotechnika, Poznań 2008



5. Szutowski L., Poradnik pilota samolotowego, Wyd. Avia-test, Poznań 2007

### Breakdown of average student's workload

	Hours	ECTS
Total workload	125	5,0
Classes requiring direct contact with the teacher	62	2,5
Student's own work (literature studies, preparation for classes, preparation for tests,) <sup>1</sup>	63	2,5

<sup>1</sup> delete or add other activities as appropriate