



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Aviation Research

Course

Field of study

Aerospace Engineering

Area of study (specialization)

-

Level of study

Second-cycle studies

Form of study

full-time

Year/Semester

1/2

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

Number of hours

Lecture

15

Laboratory classes

15

Other (e.g. online)

Tutorials

15

Projects/seminars

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

dr Jędrzej Łukasiewicz

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Faculty of Civil and Transport Engineering

ul. Piotrowo 3 60-965 Poznań

Responsible for the course/lecturer:

dr inż. Remigiusz Jasiński

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Faculty of Civil and Transport Engineering

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Prerequisites

Knowledge P6S_WG, P6S_WK

Skills P6S_UW, P6S_UK, P6S_UU, P6S_UO

Social competencies P6S_UU, P6S_KR, P6S_KO, P6S_UO

Course objective

The aim of the course is to familiarize students with research related to air transport. The acquisition of the ability to use the data contained in the Instructions for the use of air strata and the ability to assess the psychophysical state of the pilot

Course-related learning outcomes

Knowledge



1. Has broadened knowledge, necessary for understanding of profile subjects and specialist knowledge about construction, methods of construction, manufacturing, operation, air traffic management, security systems, impact on the economy, society and the aviation and aerospace environment for selected specialties:

1. Aeronautical Engineering
2. Space Engineering
3. Civil Aviation
4. Virtual Engineering in Aeronautics [P7S_WG, P7S_WK] [K2A_W01]

2. Has a structured, theoretically founded general knowledge covering key issues in the field of the impact of aviation on the natural environment, emissions of toxic compounds of aviation propulsion, emissions [P7S_WG] [K2A_08]

3. Has detailed knowledge related to selected issues in the field of human capabilities and limitations in aviation and astronautics [P7S_WG] [K2A_W16]

4. Has a structured, theoretically founded general knowledge covering key issues in the field of flight safety and risk assessment [P7S_WG] [K2A_W22]

5. Has detailed and structured knowledge in the use of aviation technical facilities in the transport of persons, goods, dangerous goods, as well as in the management of aviation operations and airports [P7S_WG] [K2A_W23]

6. Has basic knowledge in the field of law, in particular the law on civil aviation, copyright and protection of industrial property and its impact on the development of technology, can use patent information resources [P7S_WK] [K2A_W25]

Skills

1. Can communicate using various techniques in a professional environment and other environments using a formal record of construction, technical drawing, concepts and definitions of the scope of the studied field of study [P7S_UK] [K2A_U02]

2. Has the ability to self-study using modern teaching tools, such as remote lectures, websites and databases, teaching programs, e-books [P7S_UW, P7S_UU] [K2A_U03]

3. Can obtain information from literature, the Internet, databases and other sources. Can integrate the information obtained and interpret conclusions and create and justify opinions [P7S_UW, P7S_UU] [K2A_U04]

4. Is able to develop a safety instruction for an on-board device, machine or technical flying facility under specified environmental conditions [P7S_UW, P7S_KR] [K2A_U12]



Social competences

1. Understands the need to learn throughout life; can inspire and organize the learning process of other people [P7S_UU] [K2A_K01]
2. It is ready to critically evaluate your knowledge and content, recognize the importance of knowledge in solving cognitive and practical problems and consult experts in the event of difficulties in solving the problem yourself [P7S_KK] [K2A_K02]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

LECTURE: written exam of the content provided as part of conducting lectures

EXERCISES: written colloquium on tasks and contents carried out as part of conducting the classes

LABORATORY: average grade based on all reports returned after laboratory classes

Programme content

LECTURE:

1. The role of the experimental pilot
2. The influence of caffeine on the psychophysical condition of the pilot
3. Flight tests - research on prototype constructions
4. Emergency conditions of aircraft
5. Birds, as a source of danger in performing air operations

EXERCISES:

1. Human error rate in aviation
2. SID / STAR / NOTAM in response to birds-related threats
3. The probability of occurrence of emergency states for a given aircraft
4. Human limitations - stress and pressure as an influence on the psychophysical state of the pilot
5. Calculation of the aircraft's range for a non-motorized flight

LABORATORY:

1. Pilot error test
2. Study of the impact of the correctness of flight procedures on the flight
3. Influence of the microclimate in the cabin on performing air operations
4. Research on the influence of caffeine on the psychophysical state of the pilot



5. Creating instructions for use

Teaching methods

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

Laboratory (experiment) method (students independently conduct experiments)

Bibliography

Basic

1. EASA ATPL Training, Operational Procedures, Jeppesen Boeing Company GmbH, Germany 2016
2. Zagdański Z., Stany awaryjne statków powietrznych, wyd. ITWL, Warszawa 1995
3. Szczepański C., Symulatory lotu, Wyd. Politechniki Warszawskiej, 1990
4. Zagdański Z.: Stany awaryjne statków powietrznych, Wyd. ITWL, Warszawa, 1995
5. Lewitowicz J., Kustroń K., Podstawy eksploatacji statków powietrznych, Własności i właściwości eksploatacyjne statku powietrznego, Wyd. ITWL, Warszawa, 2003
6. Lewitowicz J. (red.) Podstawy eksploatacji statków powietrznych, Badania eksploatacyjne statków powietrznych, Wyd. ITWL, Warszawa,
7. Lewitowicz J., Kustroń K., Podstawy eksploatacji statków powietrznych, Własności i właściwości eksploatacyjne statku powietrznego, Wyd. ITWL, Warszawa, 2003

Additional

1. Leski J., Symulacja i symulatory, Wyd. MON, Warszawa, 1971 Podręcznik zarządzania bezpieczeństwem, Doc 9859 ICAO Organizacja Międzynarodowego Lotnictwa Cywilnego, wydanie pierwsze 2006
2. Makarowski R., Smolicz T., Czynniki ludzkie w operacjach lotniczych, ADRIANA AVIATION, Kosowizna, 2012
3. Makarowski R., Ryzyko i stres w lotnictwie sportowym, Wyd. Difin, Warszawa, 2010
4. Bartnik R., Grenda B., Galej P., Symulatory lotu oraz symulatory kontroli ruchu lotniczego w szkoleniu lotniczym, Wyd. Akademii Obrony Narodowej, Warszawa, 2014.



Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,0
Classes requiring direct contact with the teacher	45	2,0
Student's own work (preparation for tests) ¹	5	0,0

¹ delete or add other activities as appropriate