COURSE DESCRIPTION CARD - SYLLABUS

Course name

Aviation Research

Course

Field of study

Aerospace Engineering

Year/Semester

1/2

Area of study (specialization)

Profile of study

general academic

Level of study

Second-cycle studies

Course offered in

Polish

Form of study

full-time

Requirements

compulsory

Number of hours

Lecture

15

Laboratory classes

15

Other (e.g. online)

0

Tutorials

15

Projects/seminars

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

dr Jędrzej łukasiewicz

email: jedrzej.lukasiewicz@put.poznan.pl

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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Prerequisites

He has the knowledge necessary to understand the profile subjects and specialist knowledge about the construction, methods of construction, manufacturing, operation, air traffic management, safety systems, the impact on the economy, society and the environment in the field of aviation and astronautics for selected specialties. Has a basic knowledge of numerical methods, numerical dynamics of gases, using specialized software or self-developed tools. Has the ability to self-educate with the use of modern didactic tools, such as remote lectures, internet sites and databases, teaching programs, e-books

Can obtain information from literature, the Internet, databases and other sources. He can integrate interpret the obtained information and draw conclusions from it, and create and justify opinions. He got it the need for lifelong learning; can inspire and organize the learning process of other people.

He is ready to critically evaluate his knowledge and received content, recognizing the importance of knowledge in solving cognitive and practical problems and consulting experts in the case difficulties with solving the problem on their own.

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 extended knowledge necessary to understand the profile subjects and specialist knowledge about the construction, methods of construction, production, operation, air traffic management, safety systems, impact on the economy, society and the environment in the field of aviation and cosmonautics for selected specialties: Civil Aviation, UAV.

2. has an orderly, theoretically founded general knowledge covering key issues in the field of the impact of aviation on the natural environment, emission of toxic compounds from aircraft propulsion, acoustic emission of flying objects

Skills

1. is able to communicate using various techniques in the professional environment and other environments using the formal notation of construction, technical drawing, concepts and definitions of the scope of the study field .

2. has the ability to self-educate with the use of modern teaching tools, such as remote lectures, websites and databases, teaching programs, e-books.

3. can obtain information from literature, the Internet, databases and other sources. Can integrate the obtained information, interpret and draw conclusions from it, and create and justify opinions

4. is able to apply basic technical standards concerning unification and safety and recycling

Social competences

1. Understands the need for lifelong learning; can inspire and organize the learning process of other people.

2.Is ready to critically evaluate the knowledge and content received, recognize the importance of knowledge in solving cognitive and practical problems, and consult experts in case of difficulties in solving the problem on its own.

3. is aware of the importance and understands the non-technical aspects and effects of engineering activities, including its impact on the environment, and the related responsibility for decisions made

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

The exercise method (subject exercises, practice exercises) - in the form of auditorium exercises (application of the 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 method

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, 1971Podręcznik zarządzania bezpieczeństwem, Doc 9859 ICAO Organizacja Międzynarodowego Lotnictwa Cywilnego, wydanie pierwsze 2006
2. Makarowski R., Smolicz T., Czynnik ludzki 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	60	2,0
Classes requiring direct contact with the teacher	45	1,5
Student's own work (literature studies, preparation for laboratory classes and tutorials, preparation for tests and exam) [1]	15	0,5

[1] delete or add other activities as appropriate