COURSE DESCRIPTION CARD - SYLLABUS

Course name
Aviation research [S2LiK2P>BwL]

Course

Field of study
Aerospace Engineering

Year/Semester
1/1

Area of study (specialization)
–

Profile of study
practical

Level of study
second-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
15

Other
0

Tutorials
15

Projects/seminars
0

Number of credit points

2,00

Coordinators

dr hab. inż. Remigiusz Jasiński
remigiusz.jasinski@put.poznan.pl

Lecturers

Prerequisites

Has the knowledge necessary to understand profile subjects and specialist knowledge about the structure, methods of construction, production, operation, air traffic management, safety systems, impact on the economy, society and the environment in the field of aviation and aerospace for selected specialties. Has basic knowledge of numerical methods, numerical gas dynamics, using specialized software or tools created independently. Has the ability to self-educate using modern teaching tools, such as remote lectures, websites and databases, teaching programs, electronic books Is able to obtain information from literature, the Internet, databases and other sources. Is able to integrate the information obtained, interpret and draw conclusions from it, and create and justify opinions. Understands the need for lifelong learning; can inspire and organize the learning process of other people. Is ready to critically evaluate the acquired knowledge and received content, recognize the importance of knowledge in solving cognitive and practical problems, and seek the opinion of experts in case of difficulties in solving a problem independently.

Course objective

The aim of the course is to familiarize the student with research related to the activities of air transport. Acquiring the ability to use data contained in the Aircraft Operating Instructions and the ability to assess the psychophysical condition of the pilot

Course-related learning outcomes

Knowledge:
1.has extended knowledge necessary to understand the profile subjects and specialist knowledge of civil aviation, unmanned aerial vehicles, military aviation, aviation management and aeronautical engineering
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
3. has knowledge of how to develop research methodology

Skills:
1. has the ability to self-educate with the use of modern teaching tools, such as remote lectures, websites and databases, teaching programs, e-books
2. is able to apply basic technical standards concerning unification and safety and recycling
3. understands the need for lifelong learning; can inspire and organize the learning process of other people

Social competences:
1. 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
2. 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 from the content presented during the lecture
LABORATORIES: assessment of tickets and reports
PROJECT: assessment of individual parts of the project delivered throughout the course of the course and defense of the project at the end of the semester

Programme content

LECTURE:
1. The role of the test pilot
2. The influence of caffeine on the psychophysical condition of the pilot
3. Flight tests - tests of prototype structures
4. Aircraft emergency states
5. Birds as a source of danger in air operations
EXERCISES:
1. Human error rate in aviation
2. SID/STAR/NOTAM in response to bird threats
3. Probability of occurrence of emergency conditions for a given aircraft
4. Human limitations - stress and pressure as an impact on the psychophysical condition of the pilot
5. Calculation of the aircraft's range for an engineless flight
LAB:
1. Pilot error-free testing
2. Testing the impact of the correctness of explaining flight procedures on the course of the flight
3. The influence of the microclimate in the cabin on flight operations
4. Study of the influence of caffeine on the psychophysical condition of the pilot
5. Creating operating instructions

Course topics

none

Teaching methods

Informative (conventional) lecture (transmission of information in a systematized way) - may be of a

course (propedeutic) or monographic (specialized) nature
Exercise method (subject exercises, practice) - in the form of auditory 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 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	50	2,00
Classes requiring direct contact with the teacher	45	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	5	0,00