



COURSE DESCRIPTION CARD - SYLLABUS

Course name

The impact of aviation on the environment

Course

Field of study

Aerospace Engineering

Area of study (specialization)

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Level of study

Second-cycle studies

Form of study

full-time

Year/Semester

1/1

Profile of study

practical

Course offered in

Polish

Requirements

compulsory

Number of hours

Lecture

30

Laboratory classes

15

Other (e.g. online)

0

Tutorials

15

Projects/seminars

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

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Wydział Inżynierii Lądowej i Transportu

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Responsible for the course/lecturer:

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Prerequisites

Knowledge: Basic knowledge of the influence of harmful exhaust gas compounds and noise on humans.

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

Course objective

The aim of the course is to familiarize students with the impact of aviation on the environment, to



present principles and methods for assessing the negative impact of air transport on the environment. After completing the course, students should also be familiar with the methods of reducing negative environmental impacts by air transport.

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.

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:

Knowledge and skills in the field of the lecture will be tested in the form of a written or oral exam.

Classes will be passed on the basis of a written test, while the assessment from laboratories will consist of partial marks from reports and admissions.

Programme content



1. Discussion of the importance of issues related to the impact of aviation on the environment, basic knowledge in the field of acoustics
2. Noise sources in aviation
3. Methods of reducing noise in aviation (aircraft construction, aircraft engines and management)
4. Exhaust emissions from aircraft engines (formation of harmful exhaust compounds, methodology for measuring pollutant emissions from aircraft engines, measuring equipment for measuring emissions, research programs)
5. Possibilities of reducing emissions from aircraft
6. Aviation fuels (conventional and alternative)
7. Discussion of alternative propulsion of aircraft

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. Paweł Głowacki, Stefan Szczeciński: Transport lotniczy : zagrożenia ekologiczne oraz sposoby ich ograniczania, Wydawnictwa Naukowe Instytutu Lotnictwa, 2013.
2. Włodzimierz Balicki, Ryszard Chachurski, Paweł Głowacki, Jan Godzimski, Krzysztof Kawalec, Adam Kozakiewicz, Zbigniew Pągowski, Artur Rowiński, Jerzy Szczeciński, Stefan Szczeciński: Lotnicze silniki turbinowe : konstrukcja - eksploatacja - diagnostyka. Cz. 1, Wydawnictwa Naukowe Instytutu Lotnictwa, 2010
3. Jerzy Merkisz: Ekologiczne problemy silników spalinowych, Wyd. Politechniki Poznańskiej, Poznań 1998.

Additional

Sumeer Charkuj, Piotr Kozłowski, Michał Nędza: Podstawy transportu lotniczego, Konsorcjum Akademickie Kraków–Rzeszów–Zamość 2012

Podręczniki szkoleniowe EASA ATPL Series



Breakdown of average student's workload

	Hours	ECTS
Total workload	85	3,0
Classes requiring direct contact with the teacher	55	2,0
Student's own work (literature studies, preparation for laboratory classes and tutorials, preparation for tests and exam) ¹	30	1,0

¹ delete or add other activities as appropriate