



COURSE DESCRIPTION CARD - SYLLABUS

Course name

The impact of aviation on the environment

Course

Field of study

Aviation and cosmonautics

Area of study (specialization)

-

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

15

Laboratory classes

15

Other (e.g. online)

0

Tutorials

15

Projects/seminars

15

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

dr inż. Mateusz Nowak

mateusz.s.nowak@put.poznan.pl

tel. 61 665 2252

Wydział Inżynierii Lądowej i Transportu

ul. Piotrowo 3, 60-965 Poznań

Responsible for the course/lecturer:

dr inż. Remigiusz Jasiński

remigiusz.jasinski@put.poznan.pl

tel. (61) 665 2252

Wydział Inżynierii Lądowej i Transportu

ul. Piotrowo 3, 60-965 Poznań

Prerequisites

The student has basic knowledge of programming using the C language.

The student is able to deal with specific problems that arise during the programming of microcontrollers; can find information in literature or on the Internet and use it to solve his problem.

The student is able to define priorities that are important in solving the tasks set before him. The student shows independence in solving problems, acquiring and improving his knowledge and skills.

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

I. 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. Aviation Engineering
2. Space Engineering
3. Civil Aviation
4. Virtual Engineering in Aeronautics.

II. Has a structured, theoretically founded general knowledge covering key issues in the field of the impact of aviation on the environment, the emission of toxic compounds of aviation propulsion, acoustic emission of flying objects.

III. Has a structured, theoretically founded general knowledge covering key issues in the field of flight safety and risk assessment.

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

Skills

I. Is able to communicate using various techniques in the professional environment and other environments using the formal record of construction, technical drawing, concepts and definition of the scope of the studied field of study.

II. Has the ability to self-study using modern teaching tools, such as remote lectures, websites and databases, didactic programs, e-books.

III. Can acquire information from literature, the Internet, databases and other sources. Can integrate the information obtained and interpret conclusions and create and justify opinions.

Social competences

I. Understands the need to learn throughout life; can inspire and organize the learning process of other people.

II. 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 the event of difficulties in solving the problem.



III. 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.

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

Lecture with a multimedia presentation, independent work with computers, credit for the multimedia presentation and the flight of the rocket model. Materials available on the Moodle platform.

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
2. 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	76	3,0
Classes requiring direct contact with the teacher	51	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) ¹	25	1,0

¹ delete or add other activities as appropriate