



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Environmental engineering

Course

Field of study

Aviation

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

2/4

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

Number of hours

Lecture

Laboratory classes

Other (e.g. online)

30

Tutorials

Projects/seminars

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

Dr hab. inż. Rafał Ślefarski

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Wydział Inżynierii Środowiska i Energetyki

ul. Piotrowo 3 60-965 Poznań

Responsible for the course/lecturer:

mgr inż. Paweł Czyżewski

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Wydział Inżynierii Środowiska i Energetyki

ul. Piotrowo 3 60-965 Poznań

Prerequisites

A student starting this subject should have basic knowledge of chemistry, physics, mathematics, natural sciences and knowledge about transport impact on the surrounding environment. In addition student should be able to solve simple problems using publicly available databases such as scientific articles, legal acts or the Internet.

Course objective

To acquaint students with the knowledge about basics of environmental protection in aviation industry and related industries using fuel combustion processes.

Course-related learning outcomes

Knowledge



1. has ordered, theoretically founded general knowledge in the field of technology and various means of air transport, about the life cycle of means of transportation, both hardware and software, and in particular about the key processes taking place in them
2. has basic knowledge of environmental protection in transport, is aware of the risks associated with environmental protection and understands the specificity of the impact of mainly air transport on the environment as well as social, economic, legal and other non-technical conditions of engineering activities
3. has basic knowledge of aviation law, organizations operating in civil aviation and knows the basic principles of state aviation functioning, has basic knowledge of key issues in the functioning of civil aviation

Skills

1. can solve tasks using the rules of air traffic and design a runway in accordance with the applicable ICAO requirements
2. is able to design elements of means of transport with the use of data on environmental protection
3. is able to design means of transport with appropriate internal requirements (e.g. regarding environmental protection)

Social competences

1. understands that in technology, knowledge and skills very quickly become obsolete
2. is aware of the importance of knowledge in solving engineering problems and knows examples and understands the causes of faulty engineering projects that have led to serious financial and social losses, or to a serious loss of health and even life
3. is aware of the social role of a technical university graduate, in particular understands the need to formulate and provide the society, in an appropriate form, with information and opinions on engineering activities, technological achievements, as well as the achievements and traditions of the engineer profession

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: the written examination, test 5-10 questions, 90 min, minimum for positive mark is 50%

Laboratory - final test and rewarding knowledge necessary for the accomplishment of the problems in the area of the subject, evaluation of student report,

Programme content

Introduction to fuel combustion processes, methods of reducing fuel consumption in aviation, analysis of the formation of toxic compounds during the combustion of fossil fuels used in aviation, carbon dioxide balance in the atmosphere, photovoltaic smog, alternative fuels, noise and prevention methods,



EU energy policy and environmental protection, international protocols related to environmental protection,

PART-66 (PRACTICE - 11.25 hours)

MODULE 9A. HUMAN FACTORS

9.5 Physical Environment

Climate and temperature;

Working environment. [1]

Teaching methods

Lecture: multimedia presentation, illustrated with examples on the board

Laboratory exercises: practical exercises carried out in research test rig

Bibliography

Basic

1. Józef Jarosiński: Techniki czystego spalania
2. Molenda J. Steczko K. Ochrona środowiska w gazownictwie i użytkowaniu gazu
3. Jerzy Merkisz, Ireneusz. Pielecha: Alternatywne paliwa i układy napędowe
4. Warych Jerzy: Oczyszczanie przemysłowych gazów odlotowych

Additional

1. John C. Mycock: Handbook of air pollution control engineering and technology
2. PEP2040 Energy Policy of Poland to 2040
3. EU and domestic acts and standards for environmental protection in transportation and energy

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,0
Classes requiring direct contact with the teacher	30	1,5
Student's own work (literature studies, preparation for laboratory classes, consolidation of the content of classes, preparation for tests,) ¹	20	0,5

¹ delete or add other activities as appropriate