



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Noise in aviation [S1Lot2-ORL>HwL]

### Course

Field of study

Aviation

Year/Semester

3/5

Area of study (specialization)

Air Traffic Organisation

Profile of study

general academic

Level of study

first-cycle

Course offered in

Polish

Form of study

full-time

Requirements

elective

### Number of hours

Lecture

15

Laboratory classes

15

Other

0

Tutorials

0

Projects/seminars

0

### Number of credit points

3,00

### Coordinators

dr hab. inż. Małgorzata Orczyk prof. PP  
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### Lecturers

### Prerequisites

Knowledge: Basic knowledge of physics, especially acoustics. Knowledge of mathematics at a level that allows solving problems related to signal analysis. Skills: Able to analyze the interdependencies between the effects and causes of phenomena and events resulting from the laws of physics. Social competences: Prepared for teamwork.

### Course objective

The aim of the course is to familiarize students with theoretical and practical aspects related to: generation, propagation and impact of aircraft noise on humans and the environment. Students will gain practical knowledge in the use of specialist measuring equipment for recording vibroacoustic signals, measurement methods and assessment of the impact of aircraft noise on humans and the environment.

### Course-related learning outcomes

Knowledge:

1.has basic knowledge of environmental protection in transport, is aware of the threats related to environmental protection and understands the specific impact of mainly air transport on the environment and the social, economic, legal and other non-technical conditions of engineering activities

2. has basic knowledge of aviation law, organizations operating in civil aviation and knows the basic principles of functioning of state aviation, has basic knowledge of key issues of functioning of civil aviation

#### Skills:

1. is able to obtain information from various sources, including literature and databases, both in Polish and English, integrate it properly, interpret and critically evaluate it, draw conclusions, and comprehensively justify the opinions he/she formulates
2. is able to properly use information and communication techniques that are used at various stages of the implementation of aviation projects
3. is able to properly plan and perform experiments, including measurements and computer simulations, interpret the obtained results, and correctly draw conclusions from them
4. is able to design elements of means of transport using data on environmental protection
5. the student is able to perform a comprehensive assessment of the ecological parameters of the aircraft's power unit based on the values of emission indicators of harmful gaseous compounds and particulate matter

#### Social competences:

1. understands that in technology, knowledge and skills become outdated very quickly

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Knowledge acquired during the lecture is tested on the basis of a written test. The laboratory part is assessed on the basis of attendance, submitted reports from the exercises performed, and a test.

### Programme content

The course program includes the following topics: 1. Discussion and review of selected issues related to the impact of noise. 2. The impact of vibroacoustic phenomena generated by air transport on humans. 3. Main sources of aircraft noise. 4. Methods of measuring aircraft noise in the environment.

### Course topics

The lecture program includes the following topics:

1. Introduction to selected topics in acoustics.
2. Sources of noise in aircraft.
3. Assessment of aircraft noise in the environment.
4. Impact of sound on humans.
5. Assessment of noise and vibrations at the workplace.
6. Assessment and summary of classes

The laboratory program includes:

1. Introductory classes.
2. Introduction to selected topics in acoustics.
3. Impact of sound on humans - spectral analysis.
4. Assessment of aircraft noise in the environment. - fieldwork at Ławica Airport.
5. Assessment of noise at the workplace.
6. Assessment of vibrations at the workplace.
7. Assessment and summary of classes.

### Teaching methods

1. Lecture with multimedia presentation. 2. Practical (field) and accounting classes

### Bibliography

Basic:

1. Everest F.A., Podręcznik akustyki. Wydawnictwo SONIA DRAGA sp. z o. o. Katowice 2020.
2. Engel Z., Ochrona środowiska przed drganiami i hałasem. Wydawnictwo Naukowe PWN, Warszawa 2001.
3. Procedury Służb Żeglugi Powietrznej Operacje Statków Powietrznych. Tom I Procedury lotu.

Warszawa 2006.

4. Załącznik 16 do Konwencji o międzynarodowym lotnictwie cywilnym. Ochrona środowiska Tom I Hałas statków powietrznych.
5. Rozporządzenia Ministra Pracy i Polityki Społecznej dotyczące ochrony człowieka przed niekorzystnym wpływem hałasu i drgań w środowisku pracy.
6. Rozporządzenia Ministra Środowiska oraz normy dotyczące oddziaływania hałasu lotniczego w środowisku.
7. Griffin M.J., Handbook of human vibration. Wyd. Elsevier 2004..

Additional:

1. Environmental noise materiały szkoleniowe firmy Brüel & Kjær.
2. Goldstein E. B. Sensation and perception. Wadsworth, Cengage Learning 2010.  
[www.cengage.com/wadsworth](http://www.cengage.com/wadsworth).
3. Makarewicz R., Hałas w środowisku Ośrodek Wydawnictw Naukowych, Poznań 1996.
4. Rajpert T Hałas lotniczy i sposoby jego zwalczania. Wydawnictwa Komunikacji i Łączności Warszawa 1980.

### Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
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)	30	1,00