



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Operation of aircraft and aviation propulsion I

### Course

Field of study

Aerospace Engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

3/5

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

### Number of hours

Lecture

60

Laboratory classes

30

Other (e.g. online)

0

Tutorials

30

Projects/seminars

0

### Number of credit points

9

### Lecturers

Responsible for the course/lecturer:

dr hab. inż. Grzegorz Szymański

Responsible for the course/lecturer:

Wydział Inżynierii Lądowej i Transportu

ul. Piotrowo 3 60-965 Poznań

### Prerequisites

The student has basic knowledge about the construction of means of transport and the principles of operation of their components. Has knowledge of propulsion systems used in aircraft, fuels used to power these propulsion and other consumables.

### Course objective

The aim of the course is to familiarize students with the issues related to the operation of air transport means and their propulsion systems.

### Course-related learning outcomes

Knowledge

1. Has extended knowledge necessary to understand the profiled subjects and has specialist knowledge about the construction, operation, air traffic management, safety systems, economic, social and environmental impact in the field of aviation and space.



2. Has detailed knowledge related to selected issues in the field of manned and unmanned aerial vehicles, in the field of on-board equipment, control systems, communication and registration systems, automation of individual systems.
3. Has ordered, theoretically founded specialist knowledge in the field of on-board equipment: as well as on-board and terrestrial electronic communication systems, remote sensing systems, observation systems, satellite navigation systems.
4. Has detailed knowledge related to selected issues in the field of ground handling of aircraft and propulsion systems, taking into account logistics aspects.
5. Has a structured, theoretically founded general knowledge covering key issues in the field of flight safety and risk assessment.

#### 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. Can analyze facilities and technical solutions, can search in catalogs and on manufacturers' websites, ready components of machines and devices, including means and devices for transport and storage, assess their suitability for use in own technical and organizational projects.
3. Can plan and carry out a research experiment using measuring equipment, computer simulations, can take measurements, interpret the results and draw conclusions.

#### 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 the event of difficulties in solving the problem on its own.
2. Understands the need for lifelong learning; can inspire and organize the learning process of other people.
3. is able to interact and work in a group, assuming different roles in it
4. Is aware of the social role of a technical university graduate, and especially understands the need to formulate and convey to the society, in particular through the mass media, information and opinions on technological achievements and other aspects of engineering activities; makes efforts to provide such information and opinions in a commonly understandable manner.

#### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: Written or oral test

Classes: Written credit - assessment of the tasks solved by the student

Laboratory: Credit based on reports from classes prepared by the student



## Programme content

Lecture: Consideration of issues related to the operation of flying objects, concepts related to operation, stages of operation, operation process, record of operation in mathematical and graphic form, operational characteristics, an aircraft as an object of operation, basics of operational research and diagnostic tests. Overview of the construction and operation of aviation piston and turbine drives.

Exercises: include sample tasks related to the content presented in the lecture.

Laboratories: practical classes dealing with issues related to the operation and testing of technical facilities.

## Teaching methods

Informative (conventional) lecture (providing information in a structured way) - may be of a course (introductory) or monographic (specialist) character.

Exercise method (subject exercises, practice exercises) - in the form of auditorium exercises

Laboratory (experiment) method (students independently conduct experiments)

## Bibliography

### Basic

1. Lewitowicz J.: Podstawy eksploatacji statków powietrznych - statek powietrzny i elementy teorii. Wydawnictwo Instytutu Technicznego Wojsk Lotniczych, Warszawa 2001.
2. Lewitowicz J.: Podstawy eksploatacji statków powietrznych - własności i właściwości eksploatacyjne statku powietrznego. Wydawnictwo Instytutu Technicznego Wojsk Lotniczych, Warszawa 2003.
3. Lewitowicz J.: Podstawy eksploatacji statków powietrznych - badania eksploatacyjne statków powietrznych. Wydawnictwo Instytutu Technicznego Wojsk Lotniczych, Warszawa 2007.
4. Lewitowicz J.: Podstawy eksploatacji statków powietrznych - eksploatacyjne problemy w projektowaniu i modernizacji statków powietrznych. Wydawnictwo Instytutu Technicznego Wojsk Lotniczych, Warszawa 2012.

### Additional

1. Cwojdzński L.: Eksploatacja samolotów wielozadaniowych w działaniach bojowych. Wydawnictwo Instytutu Technicznego Wojsk Lotniczych, Warszawa 2014
2. Gołąbek A.: Eksploatacja i niezawodność maszyn. Wrocław, Wyd. Politechniki Wrocławskiej, 1988
3. Niziński S.: Eksploatacja obiektów technicznych. Wyd. ITeE, Radom, 2002



### Breakdown of average student's workload

	Hours	ECTS
Total workload	230	9,0
Classes requiring direct contact with the teacher	150	6,0
Student's own work (literature studies, preparation for classes, preparation for tests,) <sup>1</sup>	80	3,0

<sup>1</sup> delete or add other activities as appropriate