



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Operation of aircraft and aviation propulsion II

### Course

Field of study

Aerospace Engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

part-time

Year/Semester

3/6

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

### Number of hours

Lecture

36

Laboratory classes

0

Other (e.g. online)

0

Tutorials

18

Projects/seminars

18

### Number of credit points

7

### Lecturers

Responsible for the course/lecturer:

prof. dr hab. inż. Franciszek Tomaszewski

Responsible for the course/lecturer:

Wydział Inżynierii Lądowej i Transportu

ul. Piotrowo 3 60-965 Poznań

### Prerequisites

Knowledge and skills acquired during the course of the course: Operation of aircraft and aircraft propulsion I.

### Course objective

Expanding knowledge on the operation of aircraft and their propulsion. To acquaint the student with new drive systems.

### Course-related learning outcomes

Knowledge

1. Has extended knowledge necessary to understand the profile subjects as well as specialist knowledge about 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, and 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 draw a diagram and a complex machine element in accordance with the rules of technical drawing, can create a system diagram, select elements and perform basic calculations of the electrical and electronic system of machines or aerospace equipment.
3. 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.
4. Can assess material and environmental costs as well as labor costs for the implementation of aviation modules and on-board devices

#### 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

Project: Assessment of the completed project

### Programme content

Lecture: Engineering of exploitation, exploitation, durability and lifetime (measures and indicators of durability, ways of determining durability), operational susceptibility. Extension of issues related to the operation of aircraft, issues related to malfunctions and damage, and aircraft diagnostics.

Classes: tasks covering the issues presented during the lecture and extending the issues covered in the course: Aircraft operation and aviation propulsion I.

Project: multi-stage practical and cognitive activities related to the content of the lectures.

### 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.

Project method (individual or team implementation of a large, multi-stage cognitive or practical task.

### 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	185	7,0
Classes requiring direct contact with the teacher	75	3,0
Student's own work (literature studies, preparation for classes, preparation for tests,) <sup>1</sup>	110	4,0

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