



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Fuels and lubricants

### Course

Field of study

Aerospace Engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

1/2

Profile of study

general academic

Course offered in

Polish

Requirements

### Number of hours

Lecture

15

Laboratory classes

0

Other (e.g. online)

Tutorials

Projects/seminars

### Number of credit points

1

### Lecturers

Responsible for the course/lecturer:

prof. dr hab. inż. Wiesław Zwierzycki

Responsible for the course/lecturer:

Faculty of Civil and Transport Engineering

### Prerequisites

Knowledge: Has knowledge of the operating conditions of fuels, oils, plastic lubricants (and specialized liquids) in aerial technology, with particular emphasis on the conditions prevailing during the flight of various types of aircraft. Knows the composition of aviation fuels and other consumables, technologies for their production, diagnostic methods in the storage and use phases.

Skills: Knows the most important functional properties of aerial fuels, lubricants and technical fluids. Is able to select the appropriate consumables for various aircraft systems and indicate the appropriate substitutes (from the list of international measures).

Social competences: Understands the impact of fuel combustion and the use of lubricants on the environment. Is aware of the proper management of used petroleum products (oils and greases).

### Course objective

Getting to know the basics of construction, production, properties and use of fuels, oils, plastic lubricants (and specialist liquids) in aerial technology.



### Course-related learning outcomes

#### Knowledge

1. Has knowledge of the construction and production of fuels, oils, greases (and specialist liquids) in aviation technology
2. Has knowledge of the aging of oils and plastic greases in aerial technology and methods of diagnosing their condition

#### Skills

1. He can define the most important properties of lubricants and fuels in aerial technology

#### Social competences

1. Understands the impact of combustion of fuels and lubricants on the environment and is aware of the importance of collecting and utilizing used lubricants in aerial technology.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Written and oral exam

### Programme content

Chemical composition and methods of obtaining aerial fuels and lubricants from crude oil. Operating conditions in various types of aircraft. Physicochemical and functional properties of aerial fuels (aerial gasoline - for piston engines, aviation kerosene and broad-fraction fuels - for turbine engines). Technology of fuel preparation prior to application to aircraft tanks. Properties of lubricating oils and greases. Properties of technical (special) liquids. Diagnostics of fuels and other operating fluids. Petroleum products and the natural environment.

### Teaching methods

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

### Bibliography

#### Basic

1. Górski K., Górski W., Napędy lotnicze. Materiały pędne i smary, Wydawnictwo Komunikacji i łączności, Warszawa - 1986
2. Zwierzycki W., Płyny eksploatacyjne do środków transportu drogowego, Wydawnictwo Politechniki Poznańskiej, Poznań - 2006
3. Czarny R., Smary plastyczne, Wyd. NT, Warszawa 2004

#### Additional



### Breakdown of average student's workload

|  | Hours | ECTS |
|--|-------|------|
| Total workload   | 30    | 1,0  |
| Classes requiring direct contact with the teacher  | 15    | 0,5  |
| Student's own work (literature studies, preparation for laboratory classes, preparation for exam, <sup>1</sup> | 15    | 0,5  |

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