



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Operating fluids

### Course

Field of study

Aerospace Engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

1/1

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

### Number of hours

Lecture

15

Laboratory classes

Tutorials

0

Projects/seminars

0

Other (e.g. online)

### 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

Has basic knowledge of chemistry and general knowledge of the operation of the internal combustion engine and mechanical (industrial) devices.

Can learn using various sources of information.

Understands the need for lifelong learning

### Course objective

Getting to know the basics of construction, obtaining, ownership and use of automotive and industrial operating fluids

### Course-related learning outcomes

Knowledge

Has knowledge of the construction and production of mineral and synthetic oils. He knows the properties and types engine, gear and industrial oils (machine, compressor, turbine, gear, hydraulic, etc.) and plastic lubricants, as well as engine fuels and fluids for cooling systems. Has knowledge of the



aging of lubricating oils and methods of diagnosing their condition. He knows how consumables affect the natural environment

#### Skills

Is able to define the most important properties of lubricating oil and grease. Is able to select a lubricant for the device, taking into account its working conditions and indicate a replacement for the oil used so far.

#### Social competences

Understands the impact of combustion of fuels and lubricants on the natural environment. Is aware of the importance of collecting and utilizing used lubricating oils.

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

Learning outcomes presented above are verified as follows:

Written and oral exam

#### Programme content

Structure and production of mineral and synthetic lubricating oils. Automotive lubricants (engine and transmission oils, plastic lubricants). Other automotive operating fluids (brake fluids, cooling system fluids, washer fluids). Motor fuels (distribution problems). Industrial operating fluids (machine, compressor, turbine, gear, hydraulic oils, etc.). Service aging of oils and working fluids (condition diagnostics). Operating fluids and the environment.

#### Teaching methods

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

#### Bibliography

##### Basic

1. Zwierzycki W.: Oleje, paliwa i smary dla motoryzacji i przemysłu, Wyd. ITeE, Radom 2001
2. Zwierzycki W.: Płyny eksploatacyjne dla środków transportu drogowego. Charakterystyka funkcjonalna i ekologiczna. Wyd. Politechniki Poznańskiej, Poznań 2006

##### Additional



### Breakdown of average student's workload

	Hours	ECTS
Total workload	25	1,0
Classes requiring direct contact with the teacher	15	0,5
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	15	0,5

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