



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Operating fluids

### Course

Field of study

Year/Semester

Transport

3/6

Area of study (specialization)

Profile of study

general academic

Level of study

Course offered in

First-cycle studies

Polish

Form of study

Requirements

full-time

compulsory

### Number of hours

Lecture

Laboratory classes

Other (e.g. online)

15

15

Tutorials

Projects/seminars

0

0

### Number of credit points

3

### Lecturers

Responsible for the course/lecturer:

Responsible for the course/lecturer:

prof. dr hab. inż. Wiesław Zwierzycki

Faculty of Civil and Transport Engineering

### Prerequisites

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

SKILLS: Can learn using various sources of information.

SOCIAL COMPETENCES: 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

The student has ordered and theoretically founded general knowledge in the field of key issues of technology and detailed knowledge in the field of selected issues in this discipline of transport engineering



The student has a basic knowledge of the life cycle of means of transport, both equipment and software, and in particular about the key processes occurring in the product life cycle

#### Skills

The student is able to make a critical analysis of the functioning of transport systems and other technical solutions and to evaluate these solutions, including: is able to effectively participate in the technical inspection and assess the transport task from the point of view of non-functional requirements, has the ability to systematically conduct functional tests

#### Social competences

The student is aware of the importance of knowledge in solving engineering problems, knows examples and understands the causes of malfunctioning transport systems that have led to serious financial and social losses or to serious loss of health and even life

#### 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

1. Lecture: multimedia presentation.
2. Practical classes - laboratory.

#### Bibliography

##### Basic

1. Zwierzycki W.: Oleje, paliwa i smary dla motoryzacji i przemysłu, Wyd. ITeE, Radom 2001 (486 str.) - również serwer Biblioteki PP - materiały dydaktyczne on-line.
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	65	3,0
Classes requiring direct contact with the teacher	30	1,5
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	35	1,5

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