



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Physicochemistry of gases [S1Trans1>FG]

### Course

Field of study

Transport

Year/Semester

1/2

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

Polish

Form of study

full-time

Requirements

elective

### Number of hours

Lecture

30

Laboratory classes

0

Other

0

Tutorials

15

Projects/seminars

0

### Number of credit points

3,00

### Coordinators

dr Edyta Janeba-Bartoszewicz

edyta.janeba-bartoszewicz@put.poznan.pl

### Lecturers

### Prerequisites

Knowledge: The student knows the basics of physics and chemistry as well as the basics of thermodynamics and fluid mechanics Skills: The student use of terminology terms in the field of mechanics, thermodynamics, physics and chemistry. Correct description of the observed phenomena, analysis of the obtained results and drawing conclusions. Social competences: Work in an interdisciplinary team. Ability to lead a team and expand team knowledge.

### Course objective

Getting to know the basic relationships showing the physical and chemical properties of gases.

### Course-related learning outcomes

Knowledge:

The student has extended and in-depth knowledge of physics useful for formulating and solving selected technical tasks, in particular for correct modeling of real problems

Skills:

The student is able to properly plan and conduct perform experiments, including measurements and

computer simulations, interpret the obtained results, and correctly draw conclusions  
The student is able to design elements of means of transport using data on environmental protection

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:

Learning outcomes presented above are verified as follows:

The knowledge acquired during the lecture is verified on the basis of a written exam in the form of a test.

The skills acquired during the exercises are verified on the basis of a final test in the form of a written test.

### Programme content

Thermodynamic properties: ideal, semi-perfect and real gas equations of state, compressibility factor, standard equations of natural gases. Viscosity of gases and liquids, depending on pressure and temperature. Effect of gases on pipeline materials, thermodynamic and chemical potential. Influence of aggressive ingredients, anti-corrosion and anti-erosion protection. Combustion.

### Course topics

none

### Teaching methods

Information and problematic lecture with a multimedia presentation. Exercises - solving problems.

### Bibliography

Basic

1. J. Szargut: Termodynamika techniczna, PWN 1991
2. J. Molenda: Gaz ziemny, PWN 1999
3. H. Buchowski, W. Ufnalski „Fizykochemia gazów i cieczy”, Wydawnictwa Naukowo -Techniczne, Warszawa 2012

Additional

1. K. Pigoń, Z. Ruziewicz: Chemia fizyczna, PWN 2012

### Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	45	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	30	1,00