



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Physicochemistry of gases

		Course
Field of study	Transport	Year/Semester 1/2
Area of study (specialization)		Profile of study general academic
Level of study	First-cycle studies	Course offered in Polish
Form of study	part-time	Requirements elective

		Number of
hours		
Lecture	Laboratory classes	Other (e.g. online)
18		
Tutorials	Projects/seminars	
9		
Number of credit points		
3		

		Lecturers
Responsible for the course/lecturer:	dr Edyta Janeba-Bartoszewicz	Responsible for the course/lecturer:
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Faculty of Civil Engineering and Transport		

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:

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.

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	70	3,0
Classes requiring direct contact with the teacher	27	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) ¹	43	2,0

¹ delete or add other activities as appropriate