



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Physicochemistry of gases

		Course
Field of study		Year/Semester
Aviation and Cosmonautics		1/2
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)
30		
Tutorials	Projects/seminars	
15		
Number of credit points		
2		

		Lecturers
Responsible for the course/lecturer:		Responsible for the course/lecturer:
dr Edyta Janeba-Bartoszewicz		
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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: 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. Student 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

Student has knowledge in the field of physics, including the basics of classical mechanics, optics, electricity and magnetism, solid state physics, quantum and nuclear physics, necessary to understand specialist lectures in the field of the theory of construction materials and materials science, theory of machines and mechanisms, theory of electric drives and mechatronic systems, has an ordered, theoretically founded general knowledge covering key issues in the field of technical thermodynamics, i.e. the theory of thermodynamic changes, heat flow, thermal and cooling machines.

Skills

Student has the ability to self-educate with the use of modern teaching tools, such as remote lectures, internet websites and databases, teaching programs, and e-books.

Is able to obtain information from literature, the Internet, databases and other sources. Can integrate the obtained information, interpret and draw conclusions from it, and create and justify opinions

Social competences

Student understands the need for lifelong learning; can inspire and organize the learning process of other people. Can think and act in an entrepreneurial manner.

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	60	2,0
Classes requiring direct contact with the teacher	45	1,5
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) ¹	15	0,5

¹ delete or add other activities as appropriate