

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Physicochemistry of gases</b>		Code <b>1010601321010618480</b>
Field of study <b>Transport</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>1 / 2</b>
Elective path/specialty <b>-</b>	Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>obligatory</b>
Cycle of study: <b>First-cycle studies</b>	Form of study (full-time, part-time) <b>full-time</b>	
No. of hours Lecture: <b>2</b> Classes: <b>1</b> Laboratory: <b>-</b> Project/seminars: <b>-</b>		No. of credits <b>2</b>
Status of the course in the study program (Basic, major, other) <b>(brak)</b>		(university-wide, from another field) <b>(brak)</b>
Education areas and fields of science and art <b>technical sciences</b> <b>Technical sciences</b>		ECTS distribution (number and %) <b>2 100%</b> <b>2 100%</b>
<b>Responsible for subject / lecturer:</b>  dr Edyta Janeba_Bartoszewicz email: edyta.janeba-bartoszewicz@put.poznan.pl tel. 616652497 Transport Engineering ul. Piotrowo 3, 60-965 Poznań		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	The student knows the basics of physics and chemistry and the basics of thermodynamics and fluid mechanics
2	<b>Skills</b>	The student speaks terminology in mechanics, thermodynamics, physics and chemistry. Corrects description of observed phenomena, analysis of received results and drawing conclusions.
3	<b>Social competencies</b>	The student works in an interdisciplinary team. Ability to lead the team and expand team knowledge
<b>Assumptions and objectives of the course:</b> Demonstration of dependencies describing physical and chemical properties of gases.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b> 1. has extended and in-depth knowledge of physics useful for formulating and solving selected technical tasks, in particular for correct modeling of real problems - [T1A_W02] 2. has knowledge of ethical codes regarding transport engineering, is aware of threats related to environmental protection and understands the specificity of critical systems for security reasons (mission-critical systems - [T1A_W08])		
<b>Skills:</b> 1. is able to obtain information from various sources, including literature and databases, both in Polish and in English, appropriate to integrate them, make their interpretation and critical evaluation, draw conclusions, and fully justify the opinions they formulate - [T1A_U01] 2. can design elements of transport using data on environmental protection - [K1A_U12]		
<b>Social competencies:</b> 1. understands that in technology, knowledge and skills quickly become outdated - [T1A_K01]		
<b>Assessment methods of study outcomes</b>		
Test		
<b>Course description</b>		

<p>Thermodynamic properties: equations of state of perfect, semi-perfect and real gases, compressibility factor, standard equations of natural gases. Viscosity of gases and liquids, depending on pressure and temperature. The impact of gases on pipeline materials, thermodynamic and chemical potential. Impact of aggressive components, anti-corrosion and anti-erosive protection. Combustion.</p>		
<p><b>Basic bibliography:</b></p> <p>1. H. Buchowski, W. Ufnalski : Fyzykochemia gazów i cieczy, Wydawnictwa Naukowo -Techniczne, Warszawa 2012                  2. J. Szargut: Termodynamika techniczna, PWN 1991                  3. J. Molenda: Gaz ziemny, PWN 1999</p>		
<p><b>Additional bibliography:</b></p> <p>1. K. Pigoń, Z. Ruziewicz: Chemia fizyczna, PWN 2012</p>		
<p><b>Result of average student's workload</b></p>		
<p><b>Activity</b></p>	<p><b>Time (working hours)</b></p>	
1. Participation in the lecture	30	
2. Consultations	1	
3. Preparation for test	6	
4. Participation in the test	1	
5. Preparation for exercises	1	
6. Participation in exercises	15	
7. Consultations	1	
8. Preparation for test	3	
9. Participation in the test	1	
<p><b>Student's workload</b></p>		
<p><b>Source of workload</b></p>	<p><b>hours</b></p>	<p><b>ECTS</b></p>
Total workload	59	2
Contact hours	49	2
Practical activities	0	0