

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Physicochemistry of gases		Code 1010604211010618480
Field of study Mechanical Engineering	Profile of study (general academic, practical) (brak)	Year /Semester 1 / 1
Elective path/specialty -	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) part-time	
No. of hours Lecture: 18 Classes: 9 Laboratory: - Project/seminars: -		No. of credits 2
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art technical sciences Technical sciences		ECTS distribution (number and %) 2 100% 2 100%
Responsible for subject / lecturer: dr Edyta Janeba_Bartoszewicz email: edyta.janeba-bartoszewicz@put.poznan.pl tel. 616652497 Transport Engineering Piotrowo 3, 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	The student knows the basics of physics and chemistry and the basics of thermodynamics and fluid mechanics
2	Skills	The student speaks terminology in mechanics, thermodynamics, physics and chemistry. Corrects description of observed phenomena, analysis of received results and drawing conclusions.
3	Social competencies	The student works in an interdisciplinary team. Ability to lead the team and expand team knowledge.
Assumptions and objectives of the course: Demonstration of dependencies describing physical and chemical properties of gases.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. has knowledge of physics, including static physics: internal and external friction, thermal and electrical conductivity, diffusion - [M1A_W02]		
2. has a basic knowledge in the field of chemistry, knows the properties of chemical elements, types of chemical reactions in understanding lectures on metal and non-metal materials, environmental protection, fuels and lubricants, building materials and soil, biomechanics and biological materials processed by agricultural and food machines - [M1A_W03]		
3. Has basic knowledge in the field of technical thermodynamics, i.e. the theory of thermodynamic transformations, heat transfer, thermal machines and heating, drying and cooling devices. - [M1_W08]		
Skills:		
1. is able to obtain information from literature, the Internet, databases and other sources, in Polish and foreign languages, can integrate the information obtained, interpret it and draw conclusions from it - [M1A_U01]		
2. has the ability to self-education using modern teaching tools, such as remote lectures, internet sites and databases, teaching programs - [M1A_U27]		
Social competencies:		
1. understands the need and knows the possibilities of continuous training, knows the need to acquire new knowledge for professional development - [K1A_K01]		

Assessment methods of study outcomes		
Test		
Course description		
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.		
Basic bibliography:		
1. H. Buchowski, W. Ufnalski ? Fizykochemia gazów i cieczy?, Wydawnictwa Naukowo -Techniczne, Warszawa 2012		
2. J. Szargut: Termodynamika techniczna, PWN 1991		
3. J. Molenda: Gaz ziemny, PWN 1999		
Additional bibliography:		
1. K. Pigoń, Z. Ruziewicz: Chemia fizyczna, PWN 2012		
Result of average student's workload		
Activity	Time (working hours)	
1. Participation in the lecture	18	
2. Consultations	1	
3. Preparation for test	10	
4. Participation in the test	1	
5. Preparation for exercises	2	
6. Participation in exercises	9	
7. Consultations	2	
8. Preparation for test	6	
9. Participation in the test	1	
Student's workload		
Source of workload	hours	ECTS
Total workload	50	2
Contact hours	32	2
Practical activities	0	0