

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Gas fuels transportation</b>		Code <b>1010631361010635151</b>
Field of study <b>Transport</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>3 / 6</b>
Elective path/specialty <b>Engineering of Pipeline Transport</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>1</b> Classes: <b>1</b> Laboratory: <b>-</b> Project/seminars: <b>-</b>		No. of credits <b>1</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		ECTS distribution (number and %)
<b>Responsible for subject / lecturer:</b>  dr inż. Rafał Ślefarski email: rafal.slefarski@put.poznan.pl tel. 616652218 Faculty of Working Machines and Transportation Piotrowo3, 60-965 Poznań		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	Students have an understanding of the basics of machine design, and compression of the basics of thermodynamics, fluid mechanics.
2	<b>Skills</b>	Strict use of terminology concepts of mechanics, thermodynamics, machinery and equipment for pipelines
3	<b>Social competencies</b>	Understanding the social and economic consequences of improper or poor maintenance of machines and equipment. The ability to formulate tasks for the rational use of machines and equipment for pipelines. The ability to work and analysis team
<b>Assumptions and objectives of the course:</b> Understanding the transport of gas, gas preparation for transport. Basic principles of design and construction		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. Has a detailed knowledge of the transport systems modeling, models of transport systems, the distribution of streams in transport networks - [K2A_W10] 2. Has a structured, theoretically founded knowledge in the area of transport infrastructure, including: transport networks, the overall characterization and classification of transport infrastructure - [K2A_W12] 3. Has a structured, theoretically founded knowledge in the field of transport means, general characteristics and classification of transport, their functional properties and basic technical parameters - [K2A-W14]		
<b>Skills:</b>		
1. Is able to obtain information from the literature, internet, databases and other sources in Polish and English. Can integrate the information to interpret and learn from them, create and justify opinions - [K2A_U01] 2. Has the preparation required in industrial environment, knows safety rules for the job, is able to use for technical standards on unification, safety and recycling of machinery and equipment - [K2A_U08] 3. Is able to estimate the materials and environmental cost and labor input to develop a logistics object of own design - [K2A_U09]		
<b>Social competencies:</b>		

1. 1. Is aware of and understands the importance and impact of non-technical aspects of mechanical engineering activities and its impact on the environment and responsibility for own decisions in short and long-term aspect - [K1A_K02]
2. 2. Has a sense of responsibility for one's own work and is willing to comply with the principles of teamwork and taking responsibility for collaborative tasks - [K2A_K04]
3. 3. Is able to identify and resolve the dilemmas associated with the profession, among others. problems at the technology/environment level - [K2A_K06]
4. 4. Is aware of the transfer of knowledge to society, takes steps to ensure that the information is understandable, presents different solutions and points of view - [K2A_K08]

<b>Assessment methods of study outcomes</b>		
Final test		
<b>Course description</b>		
Preparing the ground for the transport of gas dehydration, sweetening, removal of inert gases to prevent visible to hydrate, reduce the pressure to the pressure transport. Keeping pipelines - the design optimization of routes, calculate static pressure drops. Calculations of motion resistance. Stations compression: compressors and flow. The expansion of gases: Joule effect background Thompson reducing stations of high, medium and low pressure. Safety in the transport of gases.		
<b>Basic bibliography:</b>		
1. Andrzej Barczyński, Tadeusz Podziemski, Sieci gazowe polietylenowe. Projektowanie, budowa, użytkowanie. Wytyczne, ISBN: 83-89234-01-7		
2. Andrzej J. Osiadacz: Statyczna symulacja sieci gazowych, BIG 2001		
3. Instalacje gazowe z miedzi Projektowanie wykonywanie odbiór i eksploatacja, Praca zbiorowa pod red. Andrzeja Baczyńskiego wyd. ?Polcen? 1998		
<b>Additional bibliography:</b>		
1. W. Wagner: Description of calculation of properties natural gases in wild range GERG4, Springer- 2006, LTG posiada licencję na program		
<b>Result of average student's workload</b>		
<b>Activity</b>	<b>Time (working hours)</b>	
1. Participation in exercises	30	
2. Consultation	3	
3. Preparing to pass	10	
4. Final test	4	
<b>Student's workload</b>		
<b>Source of workload</b>	<b>hours</b>	<b>ECTS</b>
Total workload	47	1
Contact hours	37	1
Practical activities	10	0