

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Utilization of machines and equipments for transportation by</b>		Code <b>1010631231010634833</b>
Field of study <b>Transport</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>2 / 3</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>Second-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>		ECTS distribution (number and %) <b>2 100%</b>
<b>Responsible for subject / lecturer:</b>  dr inż. Ryszard Piątkowski email: ryszard.piatkowski@put.poznan.pl tel. 616652214 Faculty of Working Machines and Transportation Piotrowo 3 60-965 Poznań		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	Knowledge of the construction propulsion machinery and equipment for the transport of fluids. In the construction of machines: pumps, fans, blowers and compressors. Basic knowledge of mechanical and thermal loads of machinery and equipment. Knowledge of thermodynamic, economic and environmental assessment measures perfection of machinery and power units.
2	<b>Skills</b>	Strict use of terminology concepts of mechanics, thermodynamics, machinery and equipment for pipelines. Conducting qualitative assessment of the operation and quantitative analysis based on measurements of operating parameters.
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> Presentation of the qualitative and quantitative aspects of the operation of machines and equipment for pipelines. Measures assess the quality of the operation of machinery and equipment. Adverse developments in aspects of the operation of machinery and equipment for pipelines		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. Has a structured, theoretically founded knowledge of macroeconomics, knows the process of management and its elements, entities and main elements in the process of management - [K2A-W07]		
2. Has a structured, theoretically founded knowledge in the field of transport means, general characteristics and classification - [K2A_W14]		
3. Has the knowledge and understands the basic concepts of protection of industrial property and copyright law, is able to draw on the resources of patent information - [K2A_W21]		
<b>Skills:</b>		
1. Is able to communicate using a variety of techniques in a professional environment and other environments using the formal record of the design, technical drawings, concepts and definitions in the scope of the study area - [K2A_U02]		
2. Is able to plan and carry out the experiment with the use of measuring equipment, computer simulations, can perform measurements, is able to use a popular system for numerical computations - [K2A_U07]		
3. Is able to analyze objects and technical solutions, can search the catalogs and manufacturers websites for ready-made components of machinery and equipment, including means and facilities for transport and storage - [K2A_U10]		
<b>Social competencies:</b>		

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 - [K2A\_K02]
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. Is able to think and act in an entrepreneurial manner, make decisions, work for the development of the employer and the society - [K2A\_K07]

<b>Assessment methods of study outcomes</b>		
Exam, final test		
<b>Course description</b>		
Performance characteristics of pumps, fans, blowers and compressors and engines, diesel engines, gas turbines and electric motors. Cooperation machines przetwarzających fluids drive motors. Cooperation machines przetwarzających fluids rurociągowymi networks. Phenomena specific operation: pompaż, cavitation, aging machinery and equipment. Control and monitoring of consumption. Methods of prevention of unfavorable developments and threats		
<b>Basic bibliography:</b>		
1. Fortuna St.: Wentylatory. Podstawy teoretyczne, zagadnienia konstrukcyjno eksploatacyjne i zastosowanie. TECHWENT. Kraków 1999		
2. Tuliszka E. Turbiny cieplne. WNT. Warszawa 1974		
3. Tuliszka E. Sprężarki, dmuchawy i wentylatory. WNT. Warszawa 1971		
4. Jędrał A.: Pompy. WNT. Warszawa. 2002		
<b>Additional bibliography:</b>		
<b>Result of average student's workload</b>		
Activity	Time (working hours)	
1. Participation in the lecture	15	
2. Consultation	2	
3. Preparing to pass	2	
4. Exam	3	
5. Participation in exercises	15	
6. consultations	2	
7. Preparing to pass	2	
8. Final test	3	
<b>Student's workload</b>		
Source of workload	hours	ECTS
Total workload	58	2
Contact hours	54	2
Practical activities	0	0