

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Measurements, Control and Regulation in Pipes Networks		Code 1010631311010634091
Field of study Transport	Profile of study (general academic, practical) (brak)	Year /Semester 1 / 1
Elective path/specialty Engineering of Pipeline Transport	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: Second-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 1 Classes: 1 Laboratory: 1 Project/seminars: -		No. of credits 3
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		ECTS distribution (number and %)
Responsible for subject / lecturer: dr inż. Rafał Urbaniak email: rafal.urbaniak@put.poznan.pl tel. 616652331 Faculty of Working Machines and Transportation ul. Piotrowo 3 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	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	Skills	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	Social competencies	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
Assumptions and objectives of the course: Preparing for measurements on pipeline transport systems for the quantitative assessment of the quality of life of machinery and equipment		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
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, their functional properties and basic technical parameters, standardization and unification in the construction of means of transport, the life cycle of transport means. - [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]		
Skills:		
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, such as Matlab to program a simple task simulation system with a small number of degrees of freedom. - [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, evaluate their suitability for use in own technical and organizational projects. - [K2A_U10]		
Social competencies:		

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]

Assessment methods of study outcomes		
Exam, final test		
Course description		
Description and analysis of piping components, eg gas, water, ciepłociągów, pump systems, compressed air systems, pneumatic conveying systems and hydraulic particulate materials. Construction and operation of measuring instruments. Analysis of the objective function tests. Identify the necessary measurement parameters. Collection and processing of measured values ??for quantitative assessment of the operation and the goodness of machinery and equipment. Monitoring and control in pipeline installations.		
Basic bibliography:		
Additional bibliography:		
Result of average student's workload		
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	
9. preparing to laboratory	6	
10. Participation in laboratory exercises	15	
11. Strengthening exercises report content	6	
Student's workload		
Source of workload	hours	ECTS
Total workload	71	3
Contact hours	55	2
Practical activities	27	1