

表 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Monitoring and Measuring-and-Diagnostic Systems, PG_00038118								
Field of study	Automation, Robotics and Control Systems								
Date of commencement of studies	October 2023		Academic year of realisation of subject			2024/2025			
Education level	first-cycle studies		Subject group						
Mode of study	Full-time studies		Mode of delivery			at the university			
Year of study	2		Language of instruction			Polish			
Semester of study	4		ECTS credits			3.0			
Learning profile	general academic profile		Assessment form			assessment			
Conducting unit	Department of Metrol	ation Systems -> Faculty of Electrical and Control Engineering							
Name and surname	Subject supervisor		dr inż. Tomasz Ciszewski						
of lecturer (lecturers)	Teachers								
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
	Number of study hours	30.0	0.0	15.0	0.0	0 0.0		45	
	E-learning hours included: 0.0								
Learning activity and number of study hours	Learning activity	Participation in classes includ plan	n didactic ed in study	Participation in consultation hours		Self-study		SUM	
	Number of study hours	45		4.0		26.0		75	
Subject objectives	Providing knowledge about the theory of diagnostic measurements and methods and diagnostic measurement systems used in automation. Acquiring knowledge about the principles of operation of diagnostic systems and the ability to operate such systems.								
Learning outcomes	Course outcome		Subject outcome			Method of verification			
	[K6_W03] has structured knowledge of tools and methods for measuring electrical quantities, documenting their results and assessing errors and uncertainties		the student has structured knowledge of tools and methods for measuring electrical quantities, documenting their results and assessing errors and uncertainties			[SW1] Assessment of factual knowledge			
	[K6_U04] has the ability to self- educate, among other things, in order to improve professional qualifications		the student has the ability to self- educate, among others: in order to improve professional qualifications			[SU3] Assessment of ability to use knowledge gained from the subject			
	[K6_K02] can work ir taking on different ro	the student is group, assum	n a es	[SK1] Assessment of group work skills					
Subject contents	LECTURE General problems of diagnostics. Diagnostic economy. Vibroacoustic diagnostics. Ultrasonic diagnostics. Thermovision diagnostics. Diagnostics of electrical machines. Diagnostics of electronic modules. Building monitoring. Access control systems, levels of protection. Alarming systems. FTC systems. Sparkproof systems. The structure of diagnostic systems (management of tests, test modules, the measurement procedures). Measuring equipment (DAQ card, PXI standard, measuring instruments with standard interfaces). Measurement software (methods of programming, LabVIEW environment, SCPI language). The use of wireless transmission for remote monitoring (radiomodems, GSM). Examples of measurement and diagnostic systems (diagnostics of control valves and traction motors). LABORATORY EXERCISES Using LabVIEW software for prepare measurement procedures. Cooperation of computers with the measuring equipment. Thermovision diagnostics. Detection of electrical machine faults by vibration and current (MCSA) methods.								
Prerequisites and co-requisites	Basic electric engineering knowledge. Ability to connect electrical and electronic circuits.								
Assessment methods and criteria	Subject passing criteria		Passing threshold			Percentage of the final grade			
	Midterm colloquium		60.0%			60.0%			
	Practical exercise		60.0%			40.0%			
Recommended reading	Basic literature	1. Lesiak P., Świsulski D.: Komputerowa technika pomiarowa w przykładach. Agenda Wydawnicza SIMP, Warszawa 2002. 2. Cempel C., Tomaszewski F.: Diagnostyka maszyn. Zasady ogólne. Przykłady zastosowań., ITE, Radom 1992. 3. Praca zbiorowa (red. Madura H.). Pomiary termowizyjne w praktyce. Agenda Wydawnicza PAK, Warszawa 2004.							

	Supplementary literature	 Mikulik, Jerzy: Podstawowe systemy bezpieczeństwa w budynkach inteligentnych, Wydawnictwo Politechniki Śląskiej, Gliwice 2005. 2. Nawrocki W.: Komputerowe Systemy Pomiarowe, WKŁ, Warszawa 2002 3. Świsulski D.: Komputerowa technika pomiarowa. Oprogramowanie wirtualnych przyrządów pomiarowych w LabVIEW. Agenda Wydawnicza PAK, Warszawa 2005 				
	eResources addresses	Adresy na platformie eNauczanie:				
Example issues/ example questions/ tasks being completed	1. Draw and discuss the structure of the test system.					
	2. Structure and working principle of sample-remember system.					
	3. Discuss the purpose of the bus transmission control IEC-625.					
	4. How do you determine the optimal scope of diagnosis in the enterprise.					
	5. The principle of operation of ultrasonic flaw detector analog.					
	6. Please rank the methods of mounting the accelerometers according to increasing frequency range.					
	7. To present and compare the basic configurations of the track analog measurement signals acquisition card .					
	8. What is resolution and ADC range-digital.					
	9. Bath curve-discuss the characteristic points					
	10. Discuss the construction and properties of the accelerometer of type ICP.					
Work placement	Not applicable					