



Subject card

Subject name and code	Data management and collection systems, PG_00062746						
Field of study	Technologies for Industry 5.0						
Date of commencement of studies	October 2026	Academic year of realisation of subject				2029/2030	
Education level	first-cycle studies	Subject group				Optional subject group Subject group related to scientific research in the field of study	
Mode of study	Full-time studies	Mode of delivery				at the university	
Year of study	4	Language of instruction				Polish	
Semester of study	7	ECTS credits				3.0	
Learning profile	general academic profile	Assessment form				assessment	
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor						
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	0.0	30.0	0.0	30
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours		Self-study	SUM	
	Number of study hours	30	5.0		40.0	75	
Subject objectives	The aim of the course is to enable students to use their acquired knowledge of data management and collection systems by carrying out a project that includes creating a program to read data from sensors, setting up a database to store this data, and writing a program to analyze and summarize the operation of the equipment.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W06] demonstrates knowledge related to data analysis and engineering, machine learning, knows the principles of integrating data with management systems to analyze complex engineering and technological problems	The student demonstrates knowledge in the field of data analysis and engineering, machine learning, knows the principles of integrating data with management systems to analyze complex engineering and technological problems.			[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects		
	[K6_U04] has the ability to perceive and take into account non-technical aspects (legal, economic, ethical, environmental, human factor and others) of engineering problems and tasks and create solutions that take them into account	The student is able to notice and take into account non-technical aspects (legal, economic, ethical, environmental, human factor and others) of engineering problems and tasks and create solutions that take them into account			[SU5] Assessment of ability to present the results of task [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment		

Subject contents	<p>Course content – project Introduction to Data Management and Collection Systems</p> <ul style="list-style-type: none"> • Overview of Basic Concepts and Technologies • Architecture of Data Management Systems • Overview of Popular Platforms and Tools <p>Collecting Data from Sensors</p> <ul style="list-style-type: none"> • Types of Sensors (e.g., Thermocouples, Pressure, Humidity Sensors) • Reading Data from Sensors Using LabVIEW • Communication and Interfaces (e.g., UART, HART, 4-20mA) <p>Creating a Database</p> <ul style="list-style-type: none"> • Choosing the Right Database (e.g., SQL, NoSQL) • Installing and Configuring the Database • Designing Database Schemas <p>Integrating Systems</p> <ul style="list-style-type: none"> • Connecting LabVIEW Applications to the Database • Scripts for Automatic Data Saving <p>Data Analysis</p> <ul style="list-style-type: none"> • Basics of Data Analysis in Python • Data Analysis Libraries (e.g., Pandas, NumPy, Matplotlib) • Creating Reports and Visualizations <p>Monitoring and Summarizing Equipment Operation</p> <ul style="list-style-type: none"> • Analyzing Historical Data • Identifying and Reporting Errors • Creating Summaries and Recommendations 		
Prerequisites and co-requisites	Knowledge of a programming language (Python, C++, etc.), knowledge of electronics and electrical engineering, knowledge of databases (SQL, NoSQL, etc.), knowledge of the LabVIEW environment		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
Recommended reading	Basic literature	Dependent on the selected project	
	Supplementary literature	n/a	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Practical activities within the subject	Not applicable		

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