



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 2025		Academic year of realisation of subject			2028/2029	
Education level	first-cycle studies		Subject group			Obligatory subject group in the field of study 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 and methods of instruction	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_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		[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU5] Assessment of ability to present the results of task		
	[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 withmanagement systems to analyze complex engineering andtechnological problems.		[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge		

Subject contents	Introduction to Data Management and Collection Systems		
	<ul style="list-style-type: none">• Overview of Basic Concepts and Technologies• Architecture of Data Management Systems• Overview of Popular Platforms and Tools		
	Collecting Data from Sensors		
	<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)		
	Creating a Database		
	<ul style="list-style-type: none">• Choosing the Right Database (e.g., SQL, NoSQL)• Installing and Configuring the Database• Designing Database Schemas		
	Integrating Systems		
	<ul style="list-style-type: none">• Connecting LabVIEW Applications to the Database• Scripts for Automatic Data Saving		
	Data Analysis		
	<ul style="list-style-type: none">• Basics of Data Analysis in Python• Data Analysis Libraries (e.g., Pandas, NumPy, Matplotlib)• Creating Reports and Visualizations		
Monitoring and Summarizing Equipment Operation			
<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
	Project realization	50.0%	100.0%
Recommended reading	Basic literature	Dependent on the selected project	
	Supplementary literature	n/a	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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