GDAŃSK UNIVERSITY OF TECHNOLOGY

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 2024	Academic year of realisation of subject	2027/2028
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_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.	[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

<table>
<tr><td>Subject contents</td><td>

Introduction to Data Management and Collection Systems

- Overview of Basic Concepts and Technologies
- Architecture of Data Management Systems
- Overview of Popular Platforms and Tools

Collecting Data from Sensors

- 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

- Choosing the Right Database (e.g., SQL, NoSQL)
- Installing and Configuring the Database
- Designing Database Schemas

Integrating Systems

- Connecting LabVIEW Applications to the Database
- Scripts for Automatic Data Saving

Data Analysis

- Basics of Data Analysis in Python
- Data Analysis Libraries (e.g., Pandas, NumPy, Matplotlib)
- Creating Reports and Visualizations

Monitoring and Summarizing Equipment Operation

- Analyzing Historical Data
- Identifying and Reporting Errors
- Creating Summaries and Recommendations

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<tr><td>Prerequisites and co-requisites</td><td>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</td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Project realization</td><td>50.0%</td><td>100.0%</td></tr>
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<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>Dependent on the selected project</td></tr>
<tr><td>Supplementary literature</td><td>n/a</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td></td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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