GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Data analysis and presentation, PG_00065612		
Field of study	Naval Architecture and Offshore Structures		
Date of commencement of studies	February 2025	Academic year of realisation of subject	2024/2025
Education level	second-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	1	Language of instruction	English
Semester of study	1	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Institute of Naval Architecture -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Marcin Życzkowski	
	Teachers	dr hab. inż. Rafał Szłapczyński dr inż. Paweł Chodnicki	

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	30.0	0.0	60
	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	60	10.0	30.0	100

Subject objectives

The student will become familiar with IT tools that enable processing and visualizing data in a clear and appealing way for the audience.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W02] demonstrates structured and theory supported knowledge encompassing key issues in the field of Naval Architecture and Ocean Engineering, enabling modeling and analysis of shipborne and offshore systems, devices, and processes	The student knows and understands the basic concepts and syntax of the Python programming language, with a particular focus on its applications in engineering and data analysis. They understand the importance of proper data visualization for the effective presentation of technical and engineering analysis results.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation
[K7_W04] demonstrates knowledge encompassing selected issues in the field of advanced knowledge, particularly in the scope of methods, techniques, tools, and algorithms specific to Naval Architecture and Ocean Engineering	The student utilizes specialized mathematical and statistical operations to identify a problem described using external data (files).	[SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation

<table>
<tr><td>Subject contents</td><td>Familiarization with the basics of the Python language:

Functions (creation, usage), understanding operators (arithmetic, logical, relational), retrieving and formatting user input, string operations (slicing, splitting, joining, letter case, pattern matching, replacing patterns, removing spaces, newline and tabulation, special characters in text), creating conditions using conditional statements (if, else, elif), introduction to new data structures (lists, sets, tuples, dictionaries), understanding list, dictionary, and set comprehensions, how loops work (for, while), file handling (loading, reading), random events (random), and handling data transmission formats (TXT, CSV, JSON).

The student will become familiar with the Pandas library, which facilitates exploring and analyzing data in tabular form. The student will learn to load and save data from various sources such as CSV files, Excel, SQL, JSON, and others, and save data back into these formats. The student will also be able to select and index data, performing operations such as filtering, sorting, grouping, merging, and more.

The student will also get acquainted with the Numpy library and will use various statistical functions and mathematical operations.

Additionally, the student will learn the Seaborn and Matplotlib libraries, creating various types of charts, including scatter plots, histograms, heatmaps, box plots, and others.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>The student knows the basics of Python programming.</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</td><td>50.0%</td><td>50.0%</td></tr>
<tr><td>Lecture</td><td>50.0%</td><td>50.0%</td></tr>
</table>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>https://www.python.org/

https://pandas.pydata.org/

https://numpy.org/

https://seaborn.pydata.org/

https://matplotlib.org/</td></tr>
<tr><td>Supplementary literature</td><td>https://www.python.org/

https://pandas.pydata.org/

https://numpy.org/

https://seaborn.pydata.org/

https://matplotlib.org/</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:
Data analysis and presentation - Moodle ID: 42827
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=42827</td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>Determine the value of the result variable after using the defined function.

Calculate the mean (median) for records that meet the specified criteria.</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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