



Subject card

Subject name and code	Data Analysis and Presentation, PG_00070352						
Field of study	Naval Architecture and Offshore Structures						
Date of commencement of studies	February 2026	Academic year of realisation of subject				2025/2026	
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	Division of Applied Computer Science -> Institute of Naval Architecture -> Faculty of Mechanical Engineering and Ship Technology -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Paweł Chodnicki				
	Teachers		dr inż. Paweł Chodnicki				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	45.0	0.0	75
	E-learning hours included: 0.0						
	eNauczanie source address: https://enauczanie.pg.edu.pl/2025/course/view.php?id=4015 Moodle ID: 4015 Data Analysis and Presentation https://enauczanie.pg.edu.pl/2025/course/view.php?id=4015						
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	75	5.0	20.0	100		
Subject objectives	The aim of the course is for students to acquire the skills of processing, analyzing, and visualizing data using the Python programming language and selected analytical libraries, as well as effectively presenting results in a clear manner appropriate to the decision-making context.						
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 language, with particular emphasis on its applications in engineering and data analysis. They understand the importance of correct 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 uses specialized mathematical and statistical operations to identify a problem described using external data (files).			[SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects		

Subject contents	<p>Course content – lecture Introduction to the fundamentals of the Python programming language:</p> <p>Functions (definition and usage); understanding operators (arithmetic, logical, and relational); user input acquisition and formatting; string operations (slicing, splitting, concatenation, case manipulation, pattern matching, pattern replacement, whitespace removal, newline and tab characters, special characters in text); conditional statements (if, else, elif); introduction to data structures (lists, sets, tuples, dictionaries); list, dictionary, and set comprehensions; loop constructs (for, while); file handling (opening, reading); random number generation; and handling data exchange formats (TXT, CSV, JSON).</p> <p>Students will become familiar with the Pandas library, which facilitates exploration and analysis of tabular data. They will learn how to load and export data from and to various sources and formats, including CSV, Excel, SQL databases, JSON, and others. Students will also perform data selection and indexing, as well as operations such as filtering, sorting, grouping, merging, and related data transformation tasks.</p> <p>Students will also be introduced to the NumPy library and will apply statistical functions and numerical operations for data analysis.</p> <p>Additionally, students will learn to use the Seaborn and Matplotlib libraries to create various types of visualizations, including scatter plots, histograms, heatmaps, box plots, and other graphical representations of data.</p> <hr/> <p>Course content – project Project</p> <p>During project sessions, students implement Python code based on the theoretical concepts introduced in the lecture component. Practical work includes the application of:</p> <ul style="list-style-type: none"> • Variable types • Data structures • Functions • Conditional statements • External modules • NumPy • Pandas • Matplotlib <p>Students solve practical data analysis tasks, perform data manipulation and transformation, and generate visualizations to present analytical results.</p>											
Prerequisites and co-requisites	The student knows the basics of programming in Python.											
Assessment methods and criteria	<table border="1" data-bbox="453 1778 1485 1870"> <thead> <tr> <th data-bbox="453 1778 799 1807">Subject passing criteria</th> <th data-bbox="804 1778 1139 1807">Passing threshold</th> <th data-bbox="1144 1778 1485 1807">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="453 1814 799 1843">Project</td> <td data-bbox="804 1814 1139 1843">50.0%</td> <td data-bbox="1144 1814 1485 1843">50.0%</td> </tr> <tr> <td data-bbox="453 1850 799 1879">Lecture</td> <td data-bbox="804 1850 1139 1879">50.0%</td> <td data-bbox="1144 1850 1485 1879">50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Project	50.0%	50.0%	Lecture	50.0%	50.0%
Subject passing criteria	Passing threshold	Percentage of the final grade										
Project	50.0%	50.0%										
Lecture	50.0%	50.0%										
Recommended reading	Basic literature	https://www.python.org/ https://pandas.pydata.org/ https://numpy.org/ https://seaborn.pydata.org/ https://matplotlib.org/										

	Supplementary literature	https://www.python.org/ https://pandas.pydata.org/ https://numpy.org/ https://seaborn.pydata.org/ https://matplotlib.org/
	eResources addresses	
Example issues/ example questions/ tasks being completed	<ul style="list-style-type: none"> Using only basic mathematical operations (addition, subtraction, multiplication, division with or without remainder, modulo), how do you check if the variable number = 2472 is divisible by both 2 and 3? Create a list containing the squares of the numbers from 1 to 100 and store as a variable Point to the line where the error is located. If the error is there, leave a corresponding comment. 	
Practical activities within the subject	Not applicable	

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