



Subject card

Subject name and code	Fundamentals of Computer Science, PG_00072240						
Field of study	Mechanical Engineering						
Date of commencement of studies	October 2026		Academic year of realisation of subject		2026/2027		
Education level	first-cycle studies		Subject group		Obligatory subject group in the field of study		
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		Polish		
Semester of study	1		ECTS credits		4.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Institute of Energy -> Faculty of Mechanical Engineering and Ship Technology -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Tomasz Muszyński				
	Teachers		dr inż. Blanka Jakubowska				
			dr hab. inż. Tomasz Muszyński				
			dr inż. Marta Drosińska-Komor				
Lesson types	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						
	eNauczanie source address: https://enauczanie.pg.edu.pl/2025/course/view.php?id=7539 Moodle ID: 7539 Podstawy informatyki, W/P ,MiBM, sem 1, zima 26/27, PG_00072240 https://enauczanie.pg.edu.pl/2025/course/view.php?id=7539						
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		5.0		35.0	100
Subject objectives	Fundamentals of Computer Science is designed for students with little or no experience in programming. The course aims to provide students with an understanding of the role that numerical computation can play in problem solving. The course aims to help students, regardless of their specialization, analyze existing software and acquire the ability to write small useful programs. Python and VBA programming languages will be used in the class.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_W03] possesses structured and theoretically grounded knowledge of design, manufacturing technologies, metrology, quality control, and operation of machine components and mechanical systems, including technical documentation and the life cycle of engineering objects	The student has knowledge of basic information technology methods used for engineering calculations, technical data analysis, and the support of creating and processing technical documentation related to the design, manufacturing, and operation of technical systems.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
	[K6_U03] is able to identify, formulate, and develop documentation for design or technological tasks, and communicate the results using appropriate tools and presentation techniques	The student is able to analyze and solve basic computational and technical problems using information technology tools, process and present results in tabular and graphical forms, and prepare documentation and presentations of completed tasks.	[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information
	[K6_K01] is aware of the need for lifelong learning and is able to select appropriate methods for self-learning and teaching others; critically evaluates his/her own knowledge; understands the importance of professional conduct and adherence to professional ethics; demonstrates entrepreneurship and innovation in the implementation of professional projects	The student is able to collaborate effectively in the implementation of IT-related tasks, independently develop their competencies, use technical documentation and online resources in the learning process, and demonstrate a responsible and ethical attitude while carrying out assigned tasks.	[SK3] Assessment of ability to organize work [SK2] Assessment of progress of work [SK1] Assessment of group work skills
Subject contents	Course content – lecture 1. Introduction to programming. Debugging, semantics and syntax of a programming language. Algebraic and logical expressions. Input/output instructions. Python basics, Anaconda development environment. VBA basics for MS Excell 2. Data representation in computer memory. Basic data types: numerical, character, enumeration, other. 3. Simple control statements: conditional and selection. Iterative control statements - loops. 4. Writing programs using own procedures and functions. Using built-in language functions and libraries (numpy, matplotlib, seaborn). File handling (loading, reading) - data transfer format. 5. Calculations in the field of mathematical analysis, algebra and statistics. 6. Data analysis and visualization. Operations on various types of data. 7. Applications of information technology in industrial systems, industry 4.0.		
	Course content – project Fundamentals of programming in Python. Data types, control structures, loops, functions, and data structures. Algorithms and program debugging. Handling text files and modules. Software testing. Methods for acquiring, processing, analysing, and visualising data using Microsoft Excel spreadsheets, including data import, formulas, functions, tables, filtering, data processing, and the creation of charts and reports. Use of the NumPy, Matplotlib, SymPy, and Math libraries. Communication with web services through APIs and the Requests library. Data visualisation and analysis. Fundamentals of numerical optimisation using the SciPy library. Implementation of individual and team-based programming projects.		
Prerequisites and co-requisites	Basics of computer science, Internet, ability to use MS Office.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Project work	50.0%	100.0%
Recommended reading	Basic literature	1. Michael Kofler/ Definitive Guide to Excel VBA / Apres / 2003 2. William Punch, Richard Enbody/ The practice of computing using Python / Pearson/Boston/2017	
	Supplementary literature	1. https://automatetheboringstuff.com/	
	eResources addresses		

Example issues/ example questions/ tasks being completed	1. Write a program that randomly selects one integer from a user-selected number compartment. 2. Write a function that converts and then prints a number from decimal to binary. 3. Based on the supplied block diagram, write a program. 4. Analyze and visualize the provided dataset.
Practical activities within the subject	Not applicable

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