



## Subject card

Subject name and code	Fundamentals of Computer Science, PG_00060448						
Field of study	Mechanical and Naval Engineering						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2024/2025		
Education level	first-cycle studies	Subject group			Obligatory subject group in the field of study		
Mode of study	Part-time studies	Mode of delivery			blended-learning		
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						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Tomasz Muszyński				
	Teachers		dr hab. inż. Tomasz Muszyński				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	18.0	0.0	0.0	18.0	0.0	36
	E-learning hours included: 18.0						
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	36		6.0		58.0	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_W07] knows the principles of engineering drawing, standards and tools used in preparation of technical documentation	The student has knowledge of the syntax, grammar and instructions of the selected programming language, its basic library and built-in functions. He knows the basic computational and data processing algorithms. Is able to use technical documentation, manuals and Internet sources to broaden his knowledge of programming languages and computing packages.	[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects
	[K6_K01] is aware of the need for complementing the knowledge throughout the whole life, is able to select proper methods of teaching and learning, critically assesses the possessed knowledge; is aware of the importance of professional conduct and following the rules of professional ethics; is able to show resourcefulness and innovation in the realisation of professional projects	The student is experienced in working in a team while solving common tasks. Cooperates with other team members at various stages of solving the entrusted problem. The student has a basic knowledge of application software for scientific and engineering calculations, as well as modern network and Internet applications. Is able to use technical documentation, manuals and Internet sources to broaden his knowledge of programming languages and computing packages.	[SK2] Assessment of progress of work [SK5] Assessment of ability to solve problems that arise in practice [SK4] Assessment of communication skills, including language correctness
[K6_U03] is able to identify, formulate and develop the documentation of a simple design or technological task, including the description of the results of this task in Polish or in a foreign language and to present the results using computer software or other aiding tools	The student is able to implement simple algorithms in a programming language. He can solve basic problems in the field of mathematical analysis, financial mathematics, algebra, basic statistics, present the results of calculations in a graphical form using a package for mathematical and statistical calculations.	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools	
Subject contents	<ol style="list-style-type: none"> <li>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</li> <li>2. Data representation in computer memory. Basic data types: numerical, character, enumeration, other.</li> <li>3. Simple control statements: conditional and selection. Iterative control statements - loops.</li> <li>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.</li> <li>5. Calculations in the field of mathematical analysis, algebra and statistics.</li> <li>6. Data analysis and visualization. Operations on various types of data.</li> <li>7. Applications of information technology in industrial systems, industry 4.0.</li> </ol>		
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	<ol style="list-style-type: none"> <li>1. Michael Kofler/ Definitive Guide to Excel VBA / Apres / 2003</li> <li>2. William Punch, Richard Enbody/ The practice of computing using Python / Pearson/Boston/2017</li> </ol>	
	Supplementary literature	1. <a href="https://automatetheboringstuff.com/">https://automatetheboringstuff.com/</a>	
	eResources addresses	Adresy na platformie eNauczanie:	

Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"><li>1. Write a program that randomly selects one integer from a user-selected number compartment.</li><li>2. Write a function that converts and then prints a number from decimal to binary.</li><li>3. Based on the supplied block diagram, write a program.</li><li>4. Analyze and visualize the provided dataset.</li></ol>
Work placement	Not applicable