GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Fundamentals of IT, PG_00055866		
Field of study	Power 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	Full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	1	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Tomasz Muszyński	
	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	2.0	18.0	50

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_U04] is able to design a simple device structure and prepare the accompanying technical documentation, conduct a basic technical and economic analysis of energy systems, including technologies using renewable and pro-ecological energy sources as well as conventional and nuclear energy, design energy installations for them and their basic elements (including electric lighting)); select, operate and control the most commonly used electrical devices and drive systems.	The student is able to use the basic IT tools to solve problems related to energy technology. The student is able to implement simple algorithms in a programming language. The student has knowledge of the syntax, grammar and instructions of the selected programming language, its basic library and built-in functions. Is able to use technical documentation, manuals and Internet sources.	[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information
[K6_K01] is aware of the need for training and self-improvement in the profession of energy and the possibility of further education; can think and act in a creative and entrepreneurial manner; can define priorities for the implementation of an individual or group task	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 [SK1] Assessment of group work skills [SK3] Assessment of ability to organize work [SK4] Assessment of communication skills, including language correctness [SK5] Assessment of ability to solve problems that arise in practice

<table>
<tr><td>Subject contents</td><td>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.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Basics of computer science, Internet, ability to use MS Office.</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>100.0%</td></tr>
</table></td></tr>
<tr><td>Recommended reading</td><td><table>
<tr><td>Basic literature</td><td>Michael Kofler/ Definitive Guide to Excel VBA / Apres / 2003

William Punch, Richard Enbody/ The practice of computing using Python / Pearson/Boston/2017</td></tr>
<tr><td>Supplementary literature</td><td>https://automatetheboringstuff.com/</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
</table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>Write a program that randomly selects one integer from a user-selected numbercompartment.

Write a function that converts and then prints a number from decimal to binary.

Based on the supplied block diagram, write a program.

Analyze and visualize the provided dataset.</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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