



## Subject card

Subject name and code	Fundamentals of IT, PG_00055866						
Field of study	Power Engineering, Power Engineering, Power Engineering						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2023/2024		
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	dr inż. Blanka Jakubowska dr hab. inż. Tomasz Muszyński					
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_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.	[SK5] Assessment of ability to solve problems that arise in practice [SK4] Assessment of communication skills, including language correctness [SK3] Assessment of ability to organize work [SK1] Assessment of group work skills [SK2] Assessment of progress of work
	[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.	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment
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	50.0%	100.0%
Recommended reading	Basic literature	Michael Kofler/ Definitive Guide to Excel VBA / Apres / 2003  William Punch, Richard Enbody/ The practice of computing using Python / Pearson/Boston/2017	
	Supplementary literature	<a href="https://automatetheboringstuff.com/">https://automatetheboringstuff.com/</a>	
	eResources addresses	Adresy na platformie eNauczanie: Podstawy informatyki, P, sem 1, zima 23/24, PG_00055866 - Moodle ID: 33292 <a href="https://enauzanie.pg.edu.pl/moodle/course/view.php?id=33292">https://enauzanie.pg.edu.pl/moodle/course/view.php?id=33292</a>	
Example issues/ example questions/ tasks being completed	Write a program that randomly selects one integer from a user-selected number compartment.  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.		

Work placement	Not applicable
----------------	----------------