



## Subject card

Subject name and code	IT Tools & Programming Languages, PG_00067262						
Field of study	Automatic Control, Cybernetics and Robotics						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2025/2026		
Education level	first-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		Polish		
Semester of study	1		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Multimedia Systems -> Faculty of Electronics Telecommunications and Informatics -> Wydział Politechniki Gdańskiej						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Karolina Marciniuk				
	Teachers		dr inż. Karolina Marciniuk				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	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	This course introduces the fundamentals of digital documentation used in the IT industry. It will present selected programming languages and tools that are useful for programmers. Students will learn to use basic tools to assemble digital documents for printing, prepare data for visualization and analysis, and present information accurately using basic multimedia tools. The course will also discuss digital and multimedia data formats, including assumptions, limitations, and technical requirements, as well as soft skills for technical documentation and the IT product development process.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U07] can apply methods of process and function support, specific to the field of study	The student will be able to effectively present his/her results and analysis, considering various forms of presentation (e.g., written reports, multimedia presentations).	[SU4] Assessment of ability to use methods and tools
	[K6_U04] can apply knowledge of programming methods and techniques as well as select and apply appropriate programming methods and tools in computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study	The student will be able to analyze the advantages and disadvantages of various IT tools and programming languages, considering their application in specific scenarios.	[SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools
	[K6_W04] knows and understands, to an advanced extent, the principles, methods and techniques of programming and the principles of computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study, and organisation of systems using computers or such devices	Students will be able to use the skills they have acquired to analyze and interpret data in greater depth, allowing them to better understand complex problems.	[SW3] Assessment of knowledge contained in written work and projects
	[K6_U09] can carry out a critical analysis of the functioning of existing technical solutions and assess these solutions, as well as apply experience related to the maintenance of technical systems, devices and facilities typical for the field of studies, gained in the professional engineering environment	The student will be able to apply the skills learned to solve specific problems, such as optimizing processes, maintaining records effectively, analyzing data and creating presentations.	[SU5] Assessment of ability to present the results of task
Subject contents	<p>Overview of the most popular programming languages - classification, technical aspects and typical areas of application.</p> <p>Development environments (IDEs) - functionality and methods of personalization.</p> <p>Digital data and tools for its processing and storage.</p> <p>Version control systems in source code management.</p> <p>Process optimization.</p> <p>Modern project management tools.</p> <p>Introduction to computer graphics.</p> <p>Digital audio.</p> <p>Office tools in the work of a programmer. Visualization and presentation of results.</p> <p>Artificial intelligence-based tools to support the programmer's work.</p>		
Prerequisites and co-requisites	Knowledge of the basics of operating systems (Windows, Linux). Understanding and ability to use basic commands in the terminal.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		60.0%	60.0%
		50.0%	40.0%

Recommended reading	Basic literature	<p>Downey, Allen, Jeffrey Elkner, and Chris Meyers. How to Think Like a Computer Scientist: Learning with Python. Green Tea Press, 2002. ISBN: 9780971677500</p> <p>Bogusław Cyganek. Programowanie w języku C++: Wprowadzenie dla inżynierów. 1. wyd. Warszawa: Wydawnictwo Naukowe PWN, 2023. Print.</p> <p>Marek Gagolewski. Programowanie w języku R: Analiza danych, obliczenia, symulacje. 2. wyd. Warszawa: Wydawnictwo Naukowe PWN, 2016. Print.</p> <p>Mertz, David. Lepszy kod w Pythonie. Red. . Warszawa: Promise, 2024, 289 s. ISBN 9788375415452</p> <p>Aubert, Gilles, and Pierre Kornprobst. Mathematical Problems in Image Processing: Partial Differential Equations and the Calculus of Variations. Second Edition. vol. 147. New York, NY: Springer Science + Business Media, 2006. Web.</p>
	Supplementary literature	<p>International Workshop on Human and Machine Perception, and V Cantoni. Human and Machine Perception 3: Thinking, Deciding and Acting / Edited by Virginio Cantoni [and Three Others]. Ed. by V. Cantoni. 1st ed. 2001. New York, New York State: Kluwer Academic Publishers, 2001. Web.</p>
	eResources addresses	
Example issues/ example questions/ tasks being completed	Python, Java, C++, JavaScript, C3, Ruby, Matlab, R, IDEs, PyCharm, Xcode, Eclipse, version control systems, Git, Bash, PowerShell, APIs, WAW, LaTeX, Overleaf, ChatGPT, MS Office, Google Doc, vector graphics, raster graphics.	
Work placement	Not applicable	

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