GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	IT tools in the work of an engineer, PG_00060210		
Field of study	Technical Physics		
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	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Zakład Fizyki Teoretycznej i Informatyki Kwantowej -> Instytut Fizyki i Informatyki Stosowanej -> Faculty of Applied Physics and Mathematics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Marta Łabuda	
	Teachers	dr hab. inż. Marta Łabuda dr inż. Paweł Syty dr inż. Ewa Erdmann dr inż. Marcin Dampc dr inż. Sebastian Bielski dr inż. Bartosz Reichel	

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	45.0	0.0	0.0	45
	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	45	5.0	25.0	75

Subject objectives	The main objective of the course is to familiarize students with the latest information technology tools useful in an engineer's work.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W05] has knowledge of programming methodology and techniques, and the use of selected IT tools in physics and technology	The student possesses knowledge in using selected information technology tools to solve various engineering problems.	[SW3] Assessment of knowledge contained in written work and projects
[K6_U02] analyzes and solves simple scientific and technical problems, based on possessed knowledge, using analytical, numerical, simulation and experimental methods	The student can analyze and solve simple scientific and technical problems using selected information technology tools.	[SU1] Assessment of task fulfilment
[K6_K05] presents own work results, transfers information in a commonly understandable manner, communicate and self-evaluate, as well as constructively evaluate the effects of other persons' work	The student can demonstrate methods for solving simple engineering tasks using selected information technology tools.	[SK5] Assessment of ability to solve problems that arise in practice

Subject contents	Introduction to the ChatGPT application, in the context of acquiring new knowledge and solving basic engineering problems. Introduction to Git as a recognized tool for version control of project documentation. Introduction to WolframAlpha, which allows for quick engineering calculations, including in the fields of mathematics, physics, and chemistry. Introduction to MATLAB as a tool for numerical calculations and engineering simulations. Introduction to LabVIEW as a tool used to create measurement systems, control them, and monitor them. Introduction to FreeFEM, which is software used to solve various mathematical problems using finite element methods and is often used to solve partial differential equations (PDEs) in various fields of science and engineering. Introduction to OpenEMS (Open Electromagnetic Field Solver) as simulation software used for the analysis of electromagnetic fields in three-dimensional structures. OpenEMS is used in the field of electromagnetic engineering, microwave engineering, antenna design, optics, and other areas where there is a need for the analysis and design of electromagnetic devices and structures. Introduction to the Linux operating system, using the example of the Ubuntu distribution. Introduction to Gnuplot as a tool for flexible data visualization. LaTeX as a sophisticated typesetting system widely used to create professional scientific, technical, and mathematical documents, enabling precise and aesthetically pleasing document formatting. Introduction to symbolic computations using Mathematica software. Configuring, managing, and utilizing remote access tools for devices and systems: SSH (private key, public key, tunneling), basics of VPN, VNC, RDP, TeamViewer. Trello as a popular project and task management tool based on the concept of a kanban board. This software allows users to create and manage task lists and projects in the form of cards placed on a virtual board. Trello is used for project management, team collaboration, task planning, progress monitoring, and cooperation in various fields.
Prerequisites and co-requisites	
Assessment methods and criteria	

Subject passing criteria	Passing threshold	Percentage of the final grade
Attendance during labs	60.0%	43.0%
Seven short tasks	60.0%	57.0%

Recommended reading	Basic literature	ChatGPT: https://platform.openai.com/docs/introduction/overview GIT: https://git-scm.com/book/pl/v2 WolframAlpha: https://www.wolframalpha.com/ Matlab: https://www.mathworks.com/help/matlab/ LabVIEW: https://www.ni.com/docs/en-US/bundle/labview/page/what-is-labview.html FreeFEM: https://doc.freefem.org/documentation/index.html openEMS: https://docs.openems.de/ Ubuntu Linux: https://ubuntu.com/tutorials/command-line-for-beginners#1-overview Gnuplot: http://www.gnuplot.info/docs_5.4/Gnuplot_5_4.pdf Latex/Overleaf: https://www.overleaf.com/learn Mathematica: https://reference.wolfram.com/language/ Trello: https://trello.com/guide
	Supplementary literature	ChatGPT: https://platform.openai.com/docs/introduction/overview GIT: https://git-scm.com/book/pl/v2 WolframAlpha: https://www.wolframalpha.com/ Matlab: https://www.mathworks.com/help/matlab/ LabVIEW: https://www.ni.com/docs/en-US/bundle/labview/page/what-is-labview.html FreeFEM: https://doc.freefem.org/documentation/index.html openEMS: https://docs.openems.de/ Ubuntu Linux: https://ubuntu.com/tutorials/command-line-for-beginners#1-overview Gnuplot: http://www.gnuplot.info/docs_5.4/Gnuplot_5_4.pdf Latex/Overleaf: https://www.overleaf.com/learn Mathematica: https://reference.wolfram.com/language/ Trello: https://trello.com/guide

	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	1. Git: Create a repository on GitLab, clone the repository, add new files to the repository, create a commit, and finally synchronize. 2. Matlab: Solve a sample system of 10 equations with 10 unknowns. 3. Gnuplot: Create a 3D plot. 4. Trello: Create a project, add project participants, add tasks to be completed, and simulate the project's progress.	
Work placement	Not applicable	

Document generated electronically. Does not require a seal or signature.