



Subject card

Subject name and code	Essentials of Computer Science, PG_00059068						
Field of study	Environmental 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 Subject group related to scientific research in the field of study		
Mode of study	Part-time studies	Mode of delivery			at the university		
Year of study	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Geotechnical and Hydraulic Engineering -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Wojciech Artichowicz				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	10.0	0.0	0.0	25
	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	25	3.0		48.0	76	
Subject objectives	Introduction to computation and data analysis using Python and the spreadsheet.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_U01] has the ability to self-education, can obtain information from literature, databases and other sources, uses information technology, Internet resources; can integrate the obtained information, make their interpretation, as well as draw conclusions and formulate and justify opinions	Student knows the sources of knowledge on programming issues and data analysis.			[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information		
	[K6_W06] has a structured and theoretically founded knowledge in the field of computer science, numerical methods and the possibilities of their applications for solving tasks, description of phenomena related to the flow of water in the environment, in open pipes and channels, filtration, migration of pollutants	Student is able to perform basic hydraulic calculations using the Python language.			[SW3] Assessment of knowledge contained in written work and projects		
	[K6_W14] knows and understands the methods of measuring basic quantities characteristic for fluid mechanics and hydraulics, hydrology; knows the calculation methods and IT tools necessary to analyze the results of laboratory and field work	Student can use spreadsheet and language python programming wording hydraulics and data analysis environmental.			[SW1] Assessment of factual knowledge		
	[K6_U02] can work individually and in a team; knows how to estimate the time needed to complete the task ordered; is able to develop and implement a work schedule that ensures deadlines	Student knows and is able to use in practice the methodology of kanban with the use of the Trello software.			[SU4] Assessment of ability to use methods and tools		

Subject contents	<p>LECTURE:</p> <p>Problems of computing in engineering.</p> <p>The principles of how computer works.</p> <p>Number systems, binary system.</p> <p>Digital representation of data (numbers, images, files, etc.).</p> <p>Introduction to databases.</p> <p>Relational databases.</p> <p>Scrum and kanban work methodologies.</p> <p>LAB:</p> <p>Python programming:</p> <ul style="list-style-type: none"> • Jupyter Notebook environment • Basics of the Markdown language • the basics of the Python language • basic data structures in Python (tuples, lists, dictionaries, sets) • conditionals and loops • numpy library • scipy library • matplotlib library (pyplot) • implementation of hydraulic calculations 											
Prerequisites and co-requisites	Knowledge of basics computer and operating system service, Windows or Linux. Knowledge of the basics of Mathematics, and Hydraulics.											
Assessment methods and criteria	<table border="1" data-bbox="448 893 1495 999"> <thead> <tr> <th data-bbox="448 893 798 927">Subject passing criteria</th> <th data-bbox="802 893 1141 927">Passing threshold</th> <th data-bbox="1145 893 1495 927">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 934 798 967">complete laboratory</td> <td data-bbox="802 934 1141 967">100.0%</td> <td data-bbox="1145 934 1495 967">50.0%</td> </tr> <tr> <td data-bbox="448 974 798 999">complete lecture</td> <td data-bbox="802 974 1141 999">60.0%</td> <td data-bbox="1145 974 1495 999">50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	complete laboratory	100.0%	50.0%	complete lecture	60.0%	50.0%
Subject passing criteria	Passing threshold	Percentage of the final grade										
complete laboratory	100.0%	50.0%										
complete lecture	60.0%	50.0%										
Recommended reading	<p>Basic literature</p> <p>Supplementary literature</p> <p>eResources addresses</p>	<p>1). Introduction to computational engineering hydraulics Szymkiewicz Romuald, Huang Suiliang, Szymkiewicz Adam Gdansk Tech Publishing house</p> <p>2) Python. Introduction. Edition V. Mark Lutz.</p> <p>Python for Data Analysis. 3rd Edition. Wes McKinney</p> <p>Adresy na platformie eNauczanie:</p>										
Example issues/ example questions/ tasks being completed	<p>Visualization of the IMGW data.</p> <p>Solution of the ordinary differential equation with the Euler's and trapezoidal methods</p> <p>Determination of the loss coefficient using the Colebrook-White's formula</p>											
Work placement	Not applicable											