GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Essentials of Computer Science I, PG_00042889		
Field of study	Environmental Engineering		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2021/2022
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	2	Language of instruction	Polish
Semester of study	4	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Faculty of Civil and Environmental Engineering		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Wojciech Artichowicz	
	Teachers	mgr inż. Paweł Wielgat mgr inż. Dominika Kalinowska dr inż. Wojciech Artichowicz	

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	30.0	0.0	0.0	60
	E-learning hours included: 0.0						
	Adresy na platformie eNauczanie:						

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	60	5.0	45.0	110

Subject objectives	The student after the end of the course acquires skills of the practical application of the computer in engineering activity. He recognizes rules of the constructions of computational algorithms and the good practice of the programming. The student can itself perform the complete program on the digital computer.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W15] 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 is able to program simple hydraulic and hydrological calculations, e.g. - calculation of the flow resistance coefficient - histogram of water levels e.t.c.	[SW3] Assessment of knowledge contained in written work and projects
[K6_U11] can use selected computer programs to support design, including CAD graphics programs	The student is able to operate the Jupyter environment and use the Python programming language. Student knows the basics of the database handling and computer algebra systems. Knows the basic elements of the language enabling hydraulic and hydrological calculations.	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task
[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	The student has an idea about the use of IT methods in environmental engineering, e.g. programming languages, computer algebra systems, databases.	[SW3] Assessment of knowledge contained in written work and projects

Subject contents

Lectures:

Entrance. The simple model of the computer, ideological bases the working of computers.History of the evolution of computational machines.. Data representation, the accuracy of calculations. Operating systems (DOS, UNIX, Windows. Computer networks - The internet, www, the e-mail.. Method of the presentation of the information in the computer. Translators and compilers, the structured programming. Basic data structures used in calculations of engineer : array, the record, the list, the tree, the heap, the queue, the graph. Algorithms and flowcharts. the Graphical form of programs. Programming languages Fortran and C. Bases of the language (objects, directions, expressions, variable index-related, structural directions , types structural, pointer. The instruction binding. Procedures and functions). Implementation enlargements. Systems of rapid application developement (RAD: Visual Basic, Delphi, C++Builder). Test news from lectures.

Introduction to Python programming.

The laboratory program

Established individually by leading laboratory-occupations in the Computer Laboratory for the study group in compliance with with the range of occupations which embraces:

Operating systems DOS and Windows. The preparation of files of ten with the utilization given hydrological. Algorithms (solution of the algebraic equation, the example of the classification given hydrological, the mathematical data handling). The programming in the tongue Python- the creation of programs in the environment of the Jupyter.

Prerequisites and co-requisites

mathematics course

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Lecture test	50.0%	50.0%
Score from laboratory	50.0%	50.0%

Recommended reading	Basic literature	Mark Lutz "Learning Python. 5 ed." O'Reilly, 2013 Ben Forta "SQL in 10 mintes." SAMS Piotr Wróblewski "Algorytmy. Struktury danych i techniki programowania." Helion, Gliwice, 2003
	Supplementary literature	Alberto Boschetti, Luca Massaron "Python, data science essentials", Packt
	eResources addresses	
Example issues/ example questions/ tasks being completed	Basic programming statements (loops, conditionals, etc.) Implementation and utilization of the dictionary in Python	
Work placement	Not applicable	