



Subject card

Subject name and code	Essentials of computer, PG_00043649						
Field of study	Environmental Engineering						
Date of commencement of studies	October 2021	Academic year of realisation of subject			2023/2024		
Education level	first-cycle studies	Subject group			Optional subject group 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	3	Language of instruction			Polish		
Semester of study	5	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 hab. inż. Piotr Zima					
	Teachers	dr inż. Wojciech Artichowicz mgr inż. Paweł Wielgat					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	15.0	15.0	0.0	0.0	60
	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	60	5.0		45.0	110	
Subject objectives	Acquaint the student with the principles of working with Office-type packages in order to prepare text documents, spreadsheets, multimedia presentations and databases. Introduction to basic numerical methods for solving nonlinear equations, systems of linear and nonlinear equations, interpolation and approximation methods, methods for numerical integration and elements of optimization .						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_W05] knows the theoretical basis of hydromechanics and its practical models, necessary to solve technical problems in the field of environmental engineering (sanitary engineering, water melioration, water management and flood protection, pollution spread)	A student is able to write a computational script in the field of hydromechanics.	[SW3] Assessment of knowledge contained in written work and projects
	[K6_K01] can think and act in a creative and enterprising way; can set priorities for the implementation of an individual or group task; understands the need for continuous training and professional responsibility for their activities and team	Student is able to work in a group	[SK5] Assessment of ability to solve problems that arise in practice [SK1] Assessment of group work skills
	[K6_W01] has knowledge in the field of mathematics, including: linear algebra, mathematical analysis and elements of mathematical statistics, probability theory, applications of mathematics, including mathematical methods and numerical methods, necessary for: 1) description and analysis of hydrological phenomena; 2) description and analysis of meteorological phenomena; 3) solving project tasks of the sanitary industry;	The student is fluent in mathematics and statistics	[SW1] Assessment of factual knowledge
	[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 use the Office package (with text documents, spreadsheets, multimedia presentations, databases) in carrying out its tasks and presentation of results. Student is able to numerically solve simple problems in the field of environmental engineering	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
	[K6_U11] can use selected computer programs to support design, including CAD graphics programs	The student is able to use information retrieval systems in distributed databases. Student is able to use information technology in the implementation of its work	[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools

Subject contents	<p>LECTURE</p> <p>Rules for creating text documents. Basic concepts of typography. Creating of text documents in a text editor. Creating of equations in text editors. Spreadsheet - basics. Graphical presentation of data in a spreadsheet. Solver in the spreadsheet. Macros - Visual Basic. The creation of the presentation. Program to creating the presentations. Examples of technical software. Solving nonlinear equations: bisection, secant, Newton and a simple iteration method. Methods for solving systems of nonlinear equations: a simple iteration and Newton method. Approximation and interpolation: Lagrange interpolation polynomials. Approximation method of least squares. Computer algebra systems.</p> <p>TUTORIALS</p> <p>Algorithms and flowcharts. Solving nonlinear equations (bisection, secant, simple iteration and Newton method). Systems of linear equations (Gaussian elimination method.) Approximation method of least squares (different types of functions) - exercises.</p> <p>LABORATORY</p> <p>Word Processing - creating the text, the principles of typography and text formatting. Create a calculation sheet, the creation of workbooks. Graphical presentation of data. Creating a multimedia presentation - practical exercises. Solving nonlinear equations on examples of hydraulic engineering (bisection method, secant, simple iteration, Newton). Systems of linear equations (Gaussian elimination method.) Approximation of least squares method (exponential function, and square).</p>														
Prerequisites and co-requisites	Knowledge of basics computer and operating system service, Windows. Knowledge of the subject Mathematics, Foundations of Computer Science I and Hydraulics.														
Assessment methods and criteria	<table border="1" data-bbox="448 1061 1487 1205"> <thead> <tr> <th data-bbox="448 1061 794 1099">Subject passing criteria</th> <th data-bbox="794 1061 1141 1099">Passing threshold</th> <th data-bbox="1141 1061 1487 1099">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 1099 794 1137">complete tutorials</td> <td data-bbox="794 1099 1141 1137">60.0%</td> <td data-bbox="1141 1099 1487 1137">40.0%</td> </tr> <tr> <td data-bbox="448 1137 794 1176">complete laboratory</td> <td data-bbox="794 1137 1141 1176">60.0%</td> <td data-bbox="1141 1137 1487 1176">30.0%</td> </tr> <tr> <td data-bbox="448 1176 794 1205">complete lecture</td> <td data-bbox="794 1176 1141 1205">60.0%</td> <td data-bbox="1141 1176 1487 1205">30.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	complete tutorials	60.0%	40.0%	complete laboratory	60.0%	30.0%	complete lecture	60.0%	30.0%
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Recommended reading	Basic literature	<ol style="list-style-type: none"> 1). Polska Norma PN-83/P-55366 ("Zasady składania tekstów w języku polskim"). 2). Williams R.: Komputer nie jest maszyną do pisania. Wydawnictwo Helion 2003. 3). Szymkiewicz R. Metody numeryczne w inżynierii wodnej, Wyd. PG, Pomorska Biblioteka Cyfrowa, Gdańsk, 2013 (pdf). 													
	Supplementary literature	<ol style="list-style-type: none"> 1). MS Office. Users manual. 2). Fortuna Z. i inni Metody numeryczne WN-T, Warszawa, 1993. 3). Ralston A. Wstęp do analizy numerycznej, PWN, Warszawa, 1971. 													
	eResources addresses	Adresy na platformie eNauczanie:													
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> 1) What are the rules for creating presentations 2) What are the typographic rules and rules of placing equations and drawings inside documents 3) Explain popular services in the Internet 4) Describe basic security rules for working in the Internet 														

Work placement	Not applicable
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