GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Informatics in geodesy , PG_00061846		
Field of study	Geodesy and Cartography		
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	Department of Geodesy -> Faculty of Civil and Environmental Engineering		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Paweł Wysocki	
	Teachers	dr inż. Wojciech Artichowicz dr inż. Krzysztof Szarf dr inż. Natalia Lasowicz dr inż. Daniel Burkacki	

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	30.0	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 aim of this course is to acquaint students with the following subjects in the field of computer science: 1.overview of databases used in geodesy 2.introduction to progamming in the Matlab/Octave/Scilab environment

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W04] has knowledge and understands the concepts of projection with elevations, Monge's and middle (perspective), has basic knowledge and understands the concepts of engineering graphics needed to work with CAD (Computer Aided Design) software in accordance with the standards and principles of geodesy, construction and IT including computer network technologies, databases and programming as well as surveying software	The student knows and understands the principles of creating databases used to perform basic geodetic calculations	[SW3] Assessment of knowledge contained in written work and projects
[K6_U05] is able to develop a simple algorithm and prepare a simple program in object-oriented language taking into account the geodetic specifics and the specificity of spatial information systems	The student is able to design and write a simple script and functions in the Matlab / Octave / Scilab environment in terms of the development of geodetic measurements, as well as their visualization using 2D and 3D charts.	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment

Subject contents	I. Databases - basic issues 1. Introduction, database structure. 2. Basics of SQL - creating tables, modifying, updating. 3. Queries to the database, filtering, sorting, conditional queries, analytical analysis. 4. Spatial (cartographic) databases - reading, updating and analyzing data. II. Lectures on programming in the Matlab/Octave/Scilab environment: 1. Introduction to the Matlab/Octave/Scilab environment 2. Language syntax 3. Programming 4. Working with files 5. Computer algebra system 6. Computational geometry III. SPREADSHEET 1. Principles of working in a spreadsheet. Cell and cell addressing. 2. Formulas, relative and absolute references. Using named ranges. Array formulas. 3. Using conditional formatting. 4. Data filtering (autofilter, standard and advanced filter). 5. Solving equations and systems of nonlinear equations (Solver add-in). 6. Preparing sheets for distribution: protecting the sheet. Pivot tables.
Prerequisites and co-requisites	
Assessment methods and criteria	

Subject passing criteria	Passing threshold	Percentage of the final grade
completion of the subject-specific tasks	60.0%	100.0%

Recommended reading	Basic literature	• Waldemar Sradomski - MATLAB. Praktyczny podręcznik modelowania. wyd. Helion, 2015 • Pratap Rudra - Matlab dla naukowców i inżynierów, wyd PWN, 2016 • Czapla K. Bazy danych. Podstawy projektowania i języka SQL. Wyd. Helion, 2015 • Ullman J., Widom J. Podstawowy wykład z systemów baz danych. Wydawnictwo Naukowo-Techniczne, Warszawa 2000
	Supplementary literature	• Bogumiła Mrozek, Zbigniew Mrozek - MATLAB i Simulink. Poradnik użytkownika. Wydanie III, wyd. Helion, 2012 • Matlab Primer by Mathworks • Litwin L., Myrda G. Systemy Informacji Geograficznej - zarządzanie danymi przestrzennymi w GIS, SIP, SIT, LIS. Wyd. Helion, 2005
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	• The basics of SQL. Create tables, modify, update and delete tables. • Database filtering - conditional queries, nesting and the IN, BETWEEN, LIKE operators. • Use of basic analytical functions. • Working with a spatial database. • Vector and raster data model. • Attribute and spatial analyzes.	
Work placement	Not applicable	

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