GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Informatics in geodesy , PG_00044794		
Field of study	Geodesy and Cartography		
Date of commencement of studies	October 2021	Academic year of realisation of subject	2021/2022
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	7.0
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. Anna Sobieraj-Żłobińska	
	Teachers	dr inż. Wojciech Artichowicz dr inż. Tadeusz Widerski dr inż. Krystyna Michałowska dr inż. Anna Sobieraj-Żłobińska 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	45.0	0.0	30.0	15.0	0.0	90

E-learning hours included: 0.0

Adresy na platformie eNauczanie:
Informatyka w geodezji - 2021_2022zima - Moodle ID: 16520
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=16520

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	90	12.0	73.0	175

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 3.introduction to C-Geo geodetic software.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[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.	[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools
	[K6_W06] has a well-grounded knowledge and understands geodesy concepts including the main methods of obtaining data about space togather with the surveying and computional methods, which from the one hand are compatible with the current legal status and from the other hand refer to measurements on the plane and cover the use of modern geodetic instruments, with taking into account the curvature of the Earth and the impact of gravity on the maner of measurements and results	The student has knowledge of various measurement data and knows the methods of their initial analysis in order to prepare for calculations.	[SW3] Assessment of knowledge contained in written work and projects
	[K6_W04] has basic 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_U04] can use contemporary geodetic instruments, including automation of measurements, data transmission and processing in a computer-instrument system with the use of computer networks	The student is able to obtain measurement data, import and use them to perform automatic geodetic calculations	[SU4] Assessment of ability to use methods and tools

Subject contents

I. Databases - basic issues

Introduction, database structure.

Basics of SQL - creating tables, modifying, updating.

Database queries - filtering, sorting, conditional queries, analytical analysis.

Spatial (cartographic) databases - reading, updating and data analysis.

II. Lectures on programming in the Matlab/Octave/Scilab environment cover the following issues:

1. Introducing and starting work in the Matlab/Octave/Scilab environment

2. Variables and data types

3. Matrices

4. 2D charts

5. 3D charts

6. Interpolation

7. Programming

8. Functions and scripts

9. Support for I/O files

III. The lecture on the learning of the use of computer software for geodetic calculations includes:

- presentations of the possibilities of C-geo software in geodetic applications,
- discussion of computational possibilities,
- discussion of graphic possibilities,
- overview of the use of the program in planning geodetic works,
- discussion of the preparation of input data to perform measurement works

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Cgeo	60.0%	35.0%
Matlab	60.0%	35.0%
Databases	60.0%	30.0%

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	Informatyka w geodezji - 2021_2022zima - Moodle ID: 16520 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=16520
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. • Performing geodetic calculations based on the obtained data • Preparation of cartographic studies based on measurement data	
Work placement	Not applicable	