GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Adjustment calculus, PG_00044802						
Field of study	Geodesy and Cartography						
Date of commencement of studies	October 2021		Academic year of realisation of subject		2022/2023		
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	3		ECTS credits		4.0		
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. Daria Filipiak-Kowszyk					
	Teachers	dr inż. Daria Filipiak-Kowszyk					

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	15.0	0.0	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	6.0	49.0	100

Subject objectives	Get acquainted with the elements of matrix algebra and the basics of statistical analysis used in the adjustment calculus.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U01] can apply the principles of physics and mathematics to a simple verification of measurement and computational methods and their results	The ability to verify the obtained calculation results.	[SU3] Assessment of ability to use knowledge gained from the subject
	[K6_U03] can use a adjustment calculations to analyze the results of measurements and determine their accuracy	The ability to verify the results of measurements and their analysis with the use of alignment calculus methods.	[SU3] Assessment of ability to use knowledge gained from the subject [SU5] Assessment of ability to present the results of task
	[K6_W03] knows and understands the principles of mathematical statistics described in the examples of the adjustment computations	Knowledge of mathematical statistics used in the alignment calculus.	[SW2] Assessment of knowledge contained in presentation

Subject contents	
	1. Matrix algebra: • basic matrix operations; • inverse of matrices; • distribution of matrices into triangular factors; • solving systems of equations using the marked and indefinite method. 2. Probabilistic basics of the equalization methods: • one-dimensional random variables (discret and continuous); • zero-one, binomial, normal distribution; • two-dimensional random variables (step and continuous); • uniform and normal distribution; • descriptive parameters of a random variable.
Prerequisites and co-requisites	Prerequisites: • basics of matrix operations (determinant, addition, multiplication) • basics of differential and integral calculus

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Colloquium 2	60.0%	50.0%
	Colloquium 1	60.0%	50.0%

Recommended reading	Basic literature	Z. Wiśniewski, 2009: Rachunek wyrównawczy w geodezji (z przykładami). Wydawnictwo UWM. Olsztyn. Z. Wiśniewski, 2000: Algebra macierzy i statystyka matematyczna w rachunku wyrównawczym (teoria i zadania), Wyd. UWM, Olsztyn Z. Adamczewski, 2004: Rachunek Wyrównawczy w 15 wykładach, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa
	Supplementary literature	A. Jagielski, 2007: Geodesy II. Wydawnictwo P.W.STABILL. Wydanie 2.
	eResources addresses	Adresy na platformie eNauczanie: Rachunek Wyrównawczy (2022/2023) - Moodle ID: 20792 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=20792

Example issues/ example questions/ tasks being completed	
	• determine the inverse of matrices • decompose a matrix into triangular factors • solve the system of equations using the marked and indefinite method • present descriptive parameters of a random variable

Work placement	Not applicable