GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Low-level aerial photogrammetry, PG_00053257		
Field of study	Geodesy and Cartography		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2025/2026
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	6	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Geodesy -> Faculty of Civil and Environmental Engineering -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Paweł Burdziakowski	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	15.0	0.0	0.0	45

E-learning hours included: 0.0

eNauczanie source addresses:

Moodle ID: 5236 Fotogrametria niskiego pułapu
https://enauczanie.pg.edu.pl/2025/course/view.php?id=5236

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 the course is to teach students how to perform photogrammetric measurements from unmanned aerial platforms, use photogrammetric software, and interpret results.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[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	Knows the elements of photogrammetric processing, understands the parameters of processing and understands their impact on the result.	[SU1] Assessment of task fulfilment
[K6_W07] has a well-established knowledge and understands concepts in the field of engineering geodesy including the use of calculations and measurements methods carried out with the use of geodetic instruments and photogrammetric and remote sensing technologies related to geodetic support for investment, surveying and inventory measurements and photogrammetry with remote sensing	He has knowledge of the technological cycle of low-altitude photogrammetric development.	[SW3] Assessment of knowledge contained in written work and projects
[K6_W01] has knowledge and understands the concepts of physics which allow to use optical and immersive instruments as well as positioning and satellite imaging	Can perform photogrammetric surveys from low altitudes, in accordance with the technological cycle.	[SW3] Assessment of knowledge contained in written work and projects

Subject contents

Course content – lecture
The lecture covers the following topics:

- Introduction to low-altitude photogrammetry + history
- UAVs in low-altitude photogrammetry (advantages, disadvantages, purpose)
- Functional payload
- Technological cycle of photogrammetric development, including:
- Preparatory work
- Field work
- Image processing
- NP photogrammetry products.
- Assessment of the quality and accuracy of photogrammetric processing
- Use of basic NP photogrammetric products.
- Other NP photogrammetric processing, including case studies:
- Applicable law in the field of photogrammetric processing in Poland

Course content – laboratory
The content of the laboratories covers the following topics:

- Laboratory measurement using a rotating disc and photopoints
- Preparation of preparatory documentation case study
- Preparation of an orthophotomap
- Preparation of NMT

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Characteristic	80.0%	20.0%
Photogrametric processing	80.0%	40.0%
Documantation	80.0%	40.0%

Recommended reading

Basic literature	• Drony Wiktor Wyszywacz • Fotogrametria - Zdzisław Kurczyński - PWN • Opracowania fotogrametryczne z niskiego pułapu / Michał Kędzierski (red. nauk.), Anna Fryśkowska, Damian Wierzbicki. • https://www.agisoft.com/pdf/metashape-pro_1_8_en.pdf • https://www.agisoft.com/support/tutorials/beginner-level/ • https://www.bentley.com/pl/products/product-line/reality-modeling-software/contextcapture • https://support.pix4d.com/hc/en-us/articles/360031682092-PIX4Dmapper-video-tutorials
Supplementary literature	Richard Hartley and Andrew Zisserman. 2003. Multiple View Geometry in Computer Vision (2nd. ed.). Cambridge University Press, USA.
eResources addresses	

Example issues/ example questions/ tasks being completed	Laboratory block 1: Laboratory issues (4 hours): Selecting a non-metric camera for the task Designing flight altitude for a given GSD Designing longitudinal and transverse coverage Designing a flight plan for the above data Preparing sketches and a flight plan Characteristics of UAVs for photogrammetric measurement Laboratory block 2 - Preparation of preparatory documentation Laboratory issues (4 hours) Preparation of preparatory documentation: Analysis of the terrain and adjacent space Location of the photogrammetric grid Objects affecting the mission Characteristics of the measurement task and accuracy parameters Characteristics of the UAV and camera Location and method of signalling photogrammetric control points Method of image processing Output data format Sketch Laboratory block 3 - Software operation: Laboratory issues (7 hours) Software operation: Agisoft Photo Scan Pix 4D Bentley Contex Capture PIX4DPlik manual

	Bentley Context Capture Tutorial Photogrammetric processing
Practical activites within the subject	Not applicable

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