GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Photogrammetry , PG_00061763						
Field of study	Geodesy and Cartography						
Date of commencement of studies	October 2025		Academic year of realisation of subject	2026/2027			
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 -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Katarzyna Bobkowska				
	Teachers						

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	15.0	15.0	0.0	60

E-learning hours included: 0.0

eNauczanie source addresses:

Moodle ID: 9020 Fotogrametria 2026_2027
https://enauczanie.pg.edu.pl/2025/course/view.php?id=9020

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	9.0	31.0	100

Subject objectives

1. Introduction to the definition of photogrammetry, its applications, methods, and products.
2. Introduction to the technology of orthophotomap development and its use.
3. Development of digital 3D models using photogrammetric techniques and methods.
4. Use of photogrammetry products for the analysis of engineering structures.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[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	The student knows photogrammetric technologies and can identify their applications in geodesy and engineering fields.	[SW1] Assessment of factual knowledge
[K6_U12] can perform topographic-bathymetric maps of ports, wharf and coastal areas, and can interpret marine charts and maps of coastal regions	The student is able to determine the x,y,z coordinates of points based on photogrammetric measurements.	[SU4] Assessment of ability to use methods and tools
[K6_U14] can apply the necessary skills to conduct independent work in the field of topographic surveys along with the elaborating of results, geodetic investment service, surveying and inventory measurement, photogrammetry and remote sensing, and making the maps and elaborations for legal purposes including delimitation and subdivision of real estate	The student is able to independently plan and carry out a project in the field of photogrammetric measurements.	[SU5] Assessment of ability to present the results of task
[K6_U08] can use modern measurement technologies to solve common tasks in 3D modeling	The student is able to create a 3D model of an object using modern measurement technologies.	[SU5] Assessment of ability to present the results of task

Subject contents

Course content – lecture

Course content – lecture
• Definition, history and importance of photogrammetry in modern geodesy.
• Classification of photogrammetric methods terrestrial, aerial and satellite photogrammetry.
• Principles of central and orthogonal projection.
• Geometric elements of a photographic image.
• Properties and construction of photogrammetric cameras.
• Stereoscopic vision and development of stereoscopic models.
• Principles of orthophotomap generation.
• Digital photogrammetry and automation of measurements.
• Applications of photogrammetry in engineering and environmental protection.
• Accuracy and quality analysis of photogrammetric products.

Course content – laboratory

Course content – laboratory
Laboratory classes introduce practical principles of photogrammetric image acquisition and quality assessment.
Students learn fundamental optical relationships such as hyperfocal distance and depth of field, and practice selecting exposure parameters to obtain sharp and geometrically correct images.
Single and stereoscopic images are acquired and their usable range is evaluated.
Students perform basic analytical photogrammetry calculations related to geometric relationships between the image and the object, and determine photo orientation parameters.

Course content – project

Course content – project
The project covers the full development process of a photogrammetric task from flight planning to final product analysis.
Students design a photogrammetric flight (analytical part), plan and determine elements of the photographic control network, and develop 3D models of objects using terrestrial and low-altitude aerial imagery.
The final result includes generation of an orthophotomap and a point cloud, their visualization, and analysis of geometric accuracy for engineering applications.

Prerequisites and co-requisites

Knowledge of the basics of geodesy, mathematics, and descriptive geometry. Ability to use basic geodetic instruments and process measurement data.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Project Report	80.0%	12.5%
Laboratory Report	80.0%	12.5%
Exam	60.0%	50.0%
Presentation	80.0%	5.0%
Test 2	60.0%	10.0%
Test 1	60.0%	10.0%

Recommended reading	Basic literature	Pyka K., Podstawy fotogrametrii, Akademia Górniczo-Hutnicza im.Stanisława Staszica w Krakowie, Kraków, 2023. Kurczyński Z., Fotogrametria, Wydawnictwo Naukowe PWN, Warszawa, 2014.
	Supplementary literature	-
	eResources addresses	
Example issues/ example questions/ tasks being completed	1. Definition and history of photogrammetry. 2. Advantages and disadvantages of using photogrammetric techniques and methods. 3. Principles of central and orthogonal projection. 4. Geometric principles applied in photogrammetric task development. 5. Cameras used in photogrammetry. 6. Stereoscopic vision. 7. Orthophotomap development. 8. 3D model development. 9. Applications of photogrammetry in other fields. 10. Analysis of photogrammetry products.	
Practical activites within the subject	Not applicable	

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