



Subject card

Subject name and code	Low-level aerial photogrammetry, PG_00053257						
Field of study	Geodesy and Cartography						
Date of commencement of studies	October 2020		Academic year of realisation of subject		2022/2023		
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						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Paweł Burdziakowski				
	Teachers		dr inż. Paweł Burdziakowski				
Lesson types and methods of instruction	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						
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 purpose of the course is to teach how to take photogrammetric measurements from unmanned aerial platforms, how to operate photogrammetric software, and how to interpret the results.						
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		Has knowledge of the technological process flow of low-altitude photogrammetric development.		[SW3] Assessment of knowledge contained in written work and projects		
	[K6_W01] has basic knowledge and understands the concepts of physics which allow to use optical and immersive instruments as well as positioning and satellite imaging		Knows the elements of photogrammetric development, understands the parameters of the development and understands their impact on the result.		[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		Potrafi wykonać projekt fotogrametryczny w nowoczesnym oprogramowaniu fotogrametrycznym.		[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools		

Subject contents	The course content includes the following topics: <ul style="list-style-type: none">• Introduction to low-altitude photogrammetry + history• BSP in low altitude photogrammetry (advantages, disadvantages, purpose)• Functional load• The technological cycle of photogrammetric development, including:• Preparatory works• Field work• Photographs processing• Products of photogrammetry NP.• Assessment of quality and accuracy of photogrammetric processing• Use of basic NP photogrammetric products.• Other NP photogrammetric products, including case studies:• Applicable law in the field of photogrammetric elaborations in Poland• Translated with www.DeepL.com/Translator (free version)														
Prerequisites and co-requisites															
Assessment methods and criteria	<table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td></td><td>50.0%</td><td>20.0%</td></tr><tr><td></td><td>50.0%</td><td>30.0%</td></tr><tr><td></td><td>70.0%</td><td>50.0%</td></tr></table>	Subject passing criteria	Passing threshold	Percentage of the final grade		50.0%	20.0%		50.0%	30.0%		70.0%	50.0%		
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Recommended reading	Basic literature	<ul style="list-style-type: none">• Drony Wiktor Wyszycacz• Fotogrametria - Zdzisław Kurczyński - PWN• Opracowania fotogrametryczne z niskiego pułapu / Michał Kędzierski (red. nauk.), Anna Fryškowska, 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	<ul style="list-style-type: none">• Richard Hartley and Andrew Zisserman. 2003. Multiple View Geometry in Computer Vision (2nd. ed.). Cambridge University Press, USA.													
	eResources addresses	Adresy na platformie eNauczanie:													
Example issues/ example questions/ tasks being completed	Laboratory block 1: Laboratory problems (4h):Selecting a non-metric camera for a taskDesigning the flight height for a given GSDDesign longitudinal and transverse coverageDesign flight plan for the above dataMaking sketches and flight planCharacterization of BSP for photogrammetric surveyLaboratory Block 2 - Preparatory documentationLaboratory problems (4h)Developing preparatory documentation:Analysis of terrain and adjacent spaceLocation of photogrammetric matrixObjects influencing on mission realizationCharacteristics of the measurement task and accuracy parametersBSP and camera characteristicsLocation and signalization of photogrammetric network pointsManner of processing imagesResultant data formatSketchLaboratory block 3 - Use of software: Laboratory Issues (7h)Software operation:Agisoft Photo ScanPix 4DBentley Contex CaptureManual PIX4DPlikBentley Context Capture TutorialPagePhotogrammetric development TaskTranslated with www.DeepL.com/Translator (free version)														
Work placement	Not applicable														