University of Gdańsk

Subject card

Subject name and code	Application of UAV in hydrography, PG_00131531						
Field of study	Marine Hydrography						
Date of commencement of studies	October 2024		Academic year of realisation of subject		2026/2027		
Education level	Bachelor's studies		Subject group		Optional subject group Subject group related to practical vocational preparation		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	3		Language of instruction		Polish		
Semester of study	5		ECTS credits		2.0		
Learning profile	practical		Assessment form		credit		
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Piotr Bekier				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	40.0	0.0	0.0	40
	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	40		2.0		10.0	52
Subject objectives	1. Discussion of the possibilities and limitations of using photogrammetric data obtained remotely using satellite, air and unmanned aerial vehicle systems in hydrography. 2. To familiarize students with photogrammetry methods, satellite data correction and photogrammetric data processing. 3. Developing skills in creating bathymetric maps and separating the coastline based on photogrammetric data from unmanned aerial vehicle raids. 4. Familiarization with the basic BST flight conditions and aviation law regarding flights.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[HML3-U05] when identifying, formulating and solving engineering tasks, integrate knowledge from various fields and disciplines and perceive their systemic and non-technical aspects, including ethical aspects	is able to: - When identifying, formulating and solving engineering tasks, integrate knowledge from various fields and disciplines and recognize their systemic and non-technical aspects, including ethical aspects.	[SU2] presentation/project/paper/ report [SU8] observation of student's independent or team work
[HML3-U06] make a preliminary economic assessment of the proposed solutions and engineering activities undertaken	is able to: - Make a preliminary economic assessment of the proposed solutions and undertaken engineering activities.	[SU2] presentation/project/paper/ report [SU8] observation of student's independent or team work
[HML3-U07] effectively use information and communication techniques, including utility programs to solve professional problems	is able to: - Effectively use information and communication techniques, including application programs to solve professional problems.	[SU2] presentation/project/paper/ report [SU8] observation of student's independent or team work
[HML3-W08] principles of operation and use of measuring instruments used in professional activities related to the field of study, including principles for their calibration and accuracy assessment	knows: - Principles of operation and use of measuring instruments used in professional activities related to the field of study, including the principles of their calibration and accuracy assessment.	[SW3] text preparation/written work
[HML3-U09] critically analyse the functioning of existing technical solutions and evaluate these solutions	is able to: - Critically analyze the functioning of existing technical solutions and evaluate these solutions.	[SU2] presentation/project/paper/ report [SU8] observation of student's independent or team work
[HML3-U04] use analytical, simulation and experimental methods to identify, formulate and solve engineering tasks	is able to: - Use analytical, simulation and experimental methods to identify, formulate and solve engineering tasks.	[SU2] presentation/project/paper/ report [SU8] observation of student's independent or team work

Subject contents

Classes: Aviation law.

Laboratories: Preparation and implementation of a high-precision photogrammetric survey. Improving the operation of a multi-rotor aircraft. Performing a multi-stage photogrammetric raid. Processing a measurement session obtained from a photogrammetric mission in aerial photogrammetry processing software. Principles of processing three-dimensional lidar point clouds. Generating a TIN and GRIG mesh using data collected during a photogrammetric raid. Processing of a three-dimensional lidar point cloud from an air raid

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
report	51.0%	30.0%
observation	51.0%	70.0%

Recommended reading

Basic literature	1. KURCZYŃSKI Z.: Lotnicze i satelitarne obrazowanie Ziemi. Tom I i II. Oficyna wydawnicza Politechniki Warszawskiej, Warszawa 2006. 2. KURCZYŃSKI Z., PREUSS R.: Podstawy fotogrametrii. Oficyna wydawnicza Politechniki Warszawskiej, 2011. 3. SZCZEPKOWSKI M.: Drony - teoria i praktyka. Kabe, 2016.
Supplementary literature	1. ADAMCZYK J., BĘDKOWSKI K.: Metody cyfrowe w teledetekcji. Wydawnictwo SGGW, Warszawa 2007.
eResources addresses	

Example issues/ example questions/ tasks being completed

Work placement

Not applicable

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