University of Gdańsk

Subject card

Subject name and code	Application of UAV in Hydrography - laboratory classes , PG_00201149		
Field of study	Marine Hydrography		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2028/2029
Education level	Bachelor's studies	Subject group	Obligatory subject group in the field of study 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	3.0
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	30.0	72

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-W08] knows and understands, at an advanced level, 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 at an advanced level the principles of operation and use of measuring instruments employed in professional activities related to their field of study, including the principles of their calibration and accuracy assessment	[SW3] text preparation/written work
[HML3-U04] is able to 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
[HML3-U05] when identifying, formulating and solving engineering tasks, is able to integrate knowledge from various fields and disciplines and perceive their systemic and non-technical aspects, including ethical aspects	when identifying, formulating, and solving engineering problems, is able to integrate knowledge from various fields and disciplines and recognize their systemic and non-technical aspects, including ethical considerations	[SU2] presentation/project/paper/ report [SU8] observation of student's independent or team work
[HML3-U07] is able to effectively use information and communication techniques, including utility programs to solve professional problems	is able to effectively use information and communication technologies, including software applications, to solve professional problems	[SU2] presentation/project/paper/ report [SU8] observation of student's independent or team work
[HML3-U06] is able to make a preliminary economic assessment of the proposed solutions and engineering activities undertaken	is able to conduct a preliminary economic assessment of proposed solutions and engineering measures	[SU2] presentation/project/paper/ report [SU8] observation of student's independent or team work
[HML3-U09] is able to 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 them	[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
observation	51.0%	70.0%
report	51.0%	30.0%

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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