

Subject card

Subject name and code	Application of UAV in Hydrography - lecture, PG_00201150						
Field of study	Marine Hydrography						
Date of commencement of studies	October 2027		Academic year of realisation of subject		2029/2030		
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		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	20.0	0.0	0.0	0.0	0.0	20
	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	20		1.0		29.0	50
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		[SW4] test/exam - oral or written		
Subject contents	Lectures: National and international law provisions regarding drones - unmanned aerial vehicles (UAVs). Multi-rotor aircraft - structure and principles of operation. Learning to operate a multi-rotor aircraft. Basics of aerial photogrammetry. Characteristics of modern photogrammetric technologies. Technological conditions for the construction of the Digital Relief Model. Technological stages of creating an aerial orthophotomap.						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	test		51.0%		100.0%		

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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