



Subject card

Subject name and code	HYDRO AND MARINE ENGINEERING, PG_00044840						
Field of study	Geodesy and Cartography						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2025/2026		
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	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 -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Jerzy Pyrchla					
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	15.0	0.0	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	6.0	24.0	75		
Subject objectives	To familiarize students with issues related to the use of geodetic measurement techniques in the maritime economy, including satellite techniques in the study of seas and oceans, the basics of navigation and marine hydrography.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_U12] can perform topographic-bathymetric maps of ports, wharf and coastal areas, and can interpret marine charts and maps of coastal regions	Can read and interpret data contained on maps.			[SU2] Assessment of ability to analyse information		
	[K6_W09] has knowledge and understands the concepts of marine hydrography, sea maps and coastal regions maps, as well as topographic and bathymetric surveys and spatial information systems including their supply with geodetic and hydrographic data	Can read and interpret hydrographic data provided on navigation charts.			[SW3] Assessment of knowledge contained in written work and projects		
Subject contents	Course content – lecture Numerical methods in processing geodetic data in maritime areas. Fundamentals of marine navigation. Fundamentals of marine hydrography. Altimetry - a satellite-based method for studying the seas and oceans. Gravimetric measurements at sea. Maritime Information System. Hydrodynamic models of the sea. Geophysical aspects of safety in the maritime coastal zone. Geodetic aspects in marine decision support systems.						
	Course content – exercises Calculating the problem directly using a numerical method. Comparing the results of calculations using different methods for the perimeters of a triangle defined by the positions of lighthouses located on the Bay of Gdańsk. Measuring the shoreline of the Brzeźno Pier and the Sopot Pier and comparing the results with a Google map .						
Prerequisites and co-requisites	Knowledge of issues related to geodesy						
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade		
	test	60.0%			70.0%		
	report	80.0%			30.0%		

Recommended reading	Basic literature	Kazimierz Czarnecki, Geodezja współczesna. Wyd. PWN 2014; Hofmann-Wellenhof B., Moritz H., Physical Geodesy, Institut für Navigation und Satellitengeodäsie Technische Universität Graz, Graz, Austria, 2006; Barlik M., Pachuta A. Pruszyńska-Wojciechowska M.: Ćwiczenia z geodezji fizycznej i grawimetrii geodezyjnej; Wydawnictwa Politechniki Warszawskiej, Warszawa 1992; Barlik M.: Pomiar grawimetryczny w geodezji; WPW, Warszawa 1996; Barlik M.: Wstęp do teorii figury Ziemi; WPW, Warszawa 1995; Barlik M., Pachuta A.: Geodezja fizyczna i grawimetria geodezyjna; Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2007; Czarnecki K.: Geodezja współczesna w zarysie; Wiedza i Życie Warszawa 1996; Hlibowicki R. i inni: Geodezja Wyższa i Astronomia Geodezyjna; PWN, Warszawa 1981; Szpunar W.: Podstawy geodezji wyższej; PPWK, Warszawa 1982; Basiński T., Pruszek Z., Tarnowska M., Zeidler R.: Ochrona brzegów morskich IBW PAN Gdańsk 1993.; Mirosław Jurdziński: Podstawy Nawigacji Morskiej. Gdynia: Fundacja Rozwoju Wyższej Szkoły Morskiej w Gdyni, 2003.; Franciszek Wróbel: Vademecum Nawigatora. Gdynia: Trademar, 2006
	Supplementary literature	Articles in scientific journals, e.g. Journal of Coastal Research; Journal of Marine Systems; Journal of oceanic engineering; Journal of Geophysical Research.
	eResources addresses	
Example issues/ example questions/ tasks being completed	Principles of numerical computation for solving basic geodetic problems. Methods of determining position in tetrist navigation. Describe satellite methods for studying the seas and oceans. Describe the performance of gravity measurements in maritime areas. Information sources for Maritime Information Systems. Basic geodetic tasks used in maritime decision support systems.	
Practical activities within the subject	Not applicable	

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