GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	HYDRO AND MARINE ENGINEERING, PG_00044840		
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	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		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Jerzy Pyrchla	
	Teachers	dr inż. Karol Daliga mgr inż. Kamil Łapiński dr hab. inż. Jerzy Pyrchla	

Lesson types and methods of instruction

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 familiarise students with issues related to the use of surveying techniques in marine management including satellite and gravimetric techniques in the study of the 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	Be able to apply the principles of land and nautical chart linkage	[SU3] Assessment of ability to use knowledge gained from the subject
[K6_W09] has basic knowledge and understands the concepts of marine hydrography, sea maps and coastal regions maps, as well as topograpgic and bathymetric surveys and spatial information systems including their supply with geodetic and hydrographic data	Has knowledge of the interpretation of hydrographic data, of data contained in navigational charts, and of the importance of geodetic data for maritime safety	[SW3] Assessment of knowledge contained in written work and projects

Subject contents

Numerical methods in processing of geodetic data at the marine areas. The basics of marine navigation. The basics of marine hydrography. Altimetry as the satellite method of exploration of the seas and oceans. Marine gravimetry. Marine information system. Sea hydrodynamical models. Geophysical aspects of safety in the marine coastal zone. Geodetic aspects in marine decision support systems.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
raport	80.0%	30.0%
test	60.0%	70.0%

Recommended reading	Basic literature	Kazimierz Czarnecki, Geodezja współczesna. Wyd. PWN 2014; Hofmann-Wellenhof B., Moritz H., Physical Geodesy, Institut fur 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.: Pomiary grawimetryczne 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., Pruszak 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. Eg. Journal of Coastal Research; Journal of Marine Systems; Journal of oceanic engineering; Journal of Geophysical Research.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	Numerical methods in the application for solving the principal problem of geodesy. Methods of position estimation in the framework of terrestrial navigation. Characterize the satellite methods of sea and ocean surveying. Characterize the marine gravimetric measurements. Sources of the information for the marine information system. Geodetic issues in marine decision support systems. Solving the first geodetic problem using numerical methods. Calculation of triangle circumference, basing on triangle set by lighthouses of Gdańsk bay; comparison of calculation results for different methods. Measurement of coastline from Brzeźno pier to Sopot pier; comparison of the results to the Google map.	
Work placement	Not applicable	