



Subject card

Subject name and code	MARINE HYDRO-DYNAMICS AND SHORE PROTECTION, PG_00041429						
Field of study	Civil Engineering						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2023/2024		
Education level	second-cycle studies	Subject group			Optional subject group 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	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Geotechnics, Geology and Marine Civil Engineering -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Waldemar Magda				
	Teachers		dr hab. inż. Waldemar Magda				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	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	30		5.0		15.0	50
Subject objectives	A student learns theoretical background of wind-generated water surface waves. Description of basic wave phenomena, like: wave refraction, wave diffraction, wave breaking, wave run-up on inclined surfaces. Presentation of wave loading patterns with respect to cylindrical submerged structures (small and large diameter), including submarine pipelines. Student practices measuring techniques used in water wave investigations performed in small-scale laboratory campaigns.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_U10] can analyse complicated environmental loads acting on a construction; can apply proper processes to design marine and hydroengineering constructions taking into consideration hydrological and hydraulic impact		A student is able to perform small-scale laboratory measurements in a wave-flume and prepare a final report thereof.		[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools		
	[K7_W11] has deep knowledge of marine and inland hydrotechnical constructions; has knowledge about hydraulic and hydrological constraints in design and exploitation of buildings		A student is able to define complex schemes of loadings acting on marine civil engineering structures.		[SW1] Assessment of factual knowledge		
	[K7_U01] can evaluate and list any loads acting on constructions		A student is able to: define design wave parameters, collect wave loads acting on submerged elements of marine civil engineering structures.		[SU4] Assessment of ability to use methods and tools		
Subject contents	<p>Lecture: characteristic of water surface waves, wave theories, small-amplitude wave theory (basic equations, boundary-value problem, dispersion relation), basic wave phenomena (refraction, diffraction, reflection on a vertical-wall structure, wave run-up on inclined surfaces), wind-generated waves (generation mechanisms, statistical approach, spectral approach, wave forecasting).</p> <p>Laboratory (wave flume): laboratory measurements (measurement facilities, wave generator and wave generation), generation of regular waves, wave reflection from a vertical-wall barrier, solitary wave (tsunami) generation, wave run-up on a sloped surface.</p>						

Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	laboratory exercises	60.0%	50.0%
	written test	60.0%	50.0%
Recommended reading	Basic literature	<ol style="list-style-type: none"> Hueckel S.: Budowle morskie, tom I Wiadomości ogólne, Biblioteka Oceanologii i Hydrotechniki, Wydawnictwo Morskie, Gdańsk, 1972 Poradnik hydrotechnika. Praca zbiorowa pod red. S. Massela, Wydawnictwo Morskie, Gdańsk, 1992. Druet Cz.: Hydrodynamika morskich budowli i akwenów portowych, Biblioteka Oceanologii i Hydrotechniki, Wydawnictwo Morskie, Gdańsk, 1978. 	
	Supplementary literature	<ol style="list-style-type: none"> Mani J. S.: Coastal Hydrodynamics, PHI Learning Private Limited, New Delhi, 2012. Dean R. G., Dalrymple R. A.: Water Wave Mechanics for Engineers and Scientists. Advanced Series on Ocean Engineering Volume 2, World Scientific Publishing Co. Pte. Ltd., Fourth reprinting 1994, Singapore. 	
	eResources addresses	Adresy na platformie eNauczanie: Dynamika morza - Moodle ID: 34768 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=34768	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		