



## Subject card

Subject name and code	, PG_00043288						
Field of study	Coastal and Offshore Engineering, Coastal and Offshore Engineering						
Date of commencement of studies	February 2022	Academic year of realisation of subject			2021/2022		
Education level	second-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	1	Language of instruction			Polish		
Semester of study	1	ECTS credits			3.0		
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	30.0	0.0	15.0	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		5.0		25.0	75
Subject objectives	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-induced loadings on onshore and coastal structures like: rubble mound breakwaters, vertical-wall breakwaters and cylindrical submerged structures (small and large diameter), including submarine pipelines. Student practises measuring techniques used in water wave investigations performed in small-scale laboratory campaigns.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K7_U01		Student is able to define loadings acting on coastal and offshore structures (breakwaters, submarine pipelines)		[SU2] Assessment of ability to analyse information		
	K7_W02		Student knows coastal hydrodynamics and how to compute statistical and spectral parameters of wind-driven waves		[SW1] Assessment of factual knowledge		
	K7_U02		Student is able to perform analyses of coastal and offshore structures assuming static, quasi-dynamic and dynamic loadings		[SU2] Assessment of ability to analyse information		
	K7_W08		Student has knowledge on failures of coastal and offshore structures. Student knows how to improve stability of marine structures		[SW1] Assessment of factual knowledge		
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). Hydrostatic loadings and wave-induced hydrodynamic loadings acting on coastal and offshore structures (rubble mound breakwaters, vertical-wall breakwaters, submarine pipelines).</p> <p>Laboratory (wave flume): laboratory measurements (measurement facilities, wave generator and wave generation), generation of regular waves, wave refraction from a vertical-wall barrier (standing wave), generation of tsunami wave.</p>						

Prerequisites and co-requisites	No preliminary and additional requirements		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	written test	60.0%	50.0%
	laboratory exercises	60.0%	50.0%
Recommended reading	Basic literature	<p>1. Hueckel S.: Budowle morskie, tom I – Wiadomości ogólne, Biblioteka Oceanologii i Hydrotechniki, Wydawnictwo Morskie, Gdańsk, 1972</p> <p>2. Poradnik hydrotechnika. Praca zbiorowa pod red. S. Massela, Wydawnictwo Morskie, Gdańsk, 1992.</p> <p>3. Druet Cz.: Hydrodynamika morskich budowli i akwenów portowych, Biblioteka Oceanologii i Hydrotechniki, Wydawnictwo Morskie, Gdańsk, 1978.</p>	
	Supplementary literature	<p>1. Mani J. S.: Coastal Hydrodynamics, PHI Learning Private Limited, New Delhi, 2012.</p> <p>2. 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.</p>	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		