



Subject card

Subject name and code	THEORY OF HYDRO-ENGINEERING STRUCTURES, PG_00042267						
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			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	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		3.0		27.0	75
Subject objectives	Theoretical backgrounds of static and dynamic analyses of marine civil engineering structures.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[K7_U01] can evaluate and list any loads acting on constructions		A student is able to distinguish and complete hydrostatic and hydrodynamic loads acting on marine civil engineering structures, among others: steel fixed offshore platforms, submarine pipelines, mooring-fendering dolphins.			[SU1] Assessment of task fulfilment	
	[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 analyze complex patterns of environmental loadings acting on marine civil engineering structures, among others: steel fixed offshore platforms, submarine pipelines, mooring-fendering dolphins.			[SU1] Assessment of task fulfilment	
	[K7_W11] has deep knowledge of marine and inland hydrotechnical constructions; has knowledge about hydraulic and hydrological constrains in design and exploitation of buildings		A student has an extended knowledge on marine civil engineering structures (coastal and offshore) and types of loadings acting on structures.			[SW1] Assessment of factual knowledge	
	[K7_U16] is able to estimate the technical condition of engineering object; can interpret the results of constructions and materials examination;		A student is able to evaluate the technical condition of marine civil engineering structure.			[SU2] Assessment of ability to analyse information	
Subject contents	A general characteristic of fixed offshore structures (steel and concrete platforms). Environmental loadings (wind, waves and tidal). Static analysis of offshore structures using matrix formulation and the Direct Stiffness Method. Stiffness matrix of the structure, boundary conditions, reduced equations. Solution of the matrix equation. Stress analysis in elements of steel offshore structures. Analyses of dynamic behaviour of simple vibrating structures due to cyclic wave-induced loadings. Single degree of freedom systems, basic equations, amplitude and phase lag of vibrations. Multi-degree of freedom systems. A water-hammer effect in submarine pipelines.						

Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	student's activity	100.0%	30.0%
	written test	60.0%	70.0%
Recommended reading	Basic literature	<ol style="list-style-type: none"> 1. Branicki Cz. i in.: Mechanika budowli. Ujęcie komputerowe. Arkady, Warszawa 1991. 2. Magda W.: Rurociągi podmorskie. Zasady projektowania. Wydawnictwa Naukowo-Techniczne, Warszawa 2004. 3. Mazurkiewicz B.: Stałe pełnomorskie platformy żelbetowe. Wydawnictwo Morskie, Gdańsk 1985. 4. Mazurkiewicz B.: Stałe pełnomorskie platformy stalowe. Wydawnictwo Morskie, Gdańsk 1988. 5. Karlic S.: Zarys górnictwa morskiego. Wydawnictwo Śląsk, Katowice 1983. 6. Dawson T.H.: Offshore Structural Engineering. Prentice-Hall, Englewood Cliffs, New Jersey 1983. 7. Obowiązujące normy i akty prawne dotyczące budowli hydrotechnicznych. 	
	Supplementary literature	<ol style="list-style-type: none"> 1. Gerwick B.C.: Construction of Offshore Structures. John Wiley & Sons, New York 1986. 2. Reddy D.V., Arockiasamy M.: Offshore Structures. Krieger Publishing Company, Malabar, Florida 1991. 	
	eResources addresses	Adresy na platformie eNauczanie: Teoria konstrukcji hydrotechnicznych - Moodle ID: 34839 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=34839	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		