



Subject card

Subject name and code	, PG_00057222						
Field of study	Ocean Engineering						
Date of commencement of studies	February 2022	Academic year of realisation of subject			2022/2023		
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	2	Language of instruction			Polish		
Semester of study	3	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Institute of Ocean Engineering and Ship Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Paweł Dymarski				
	Teachers		dr hab. inż. Paweł Dymarski				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	15.0	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		10.0		45.0	100
Subject objectives	The aim of the course is to familiarize students with the basics of mechanics of marine support structures, including: mechanics of anchoring systems and basic models of structure-seabed interaction.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[K7_U05] can conduct an initial economic analysis of an investment in the range of ocean technology, indicate detailed rules of law and branch regulations		The student will be able to make an initial estimation of the mass of the supporting structure (including the tower)			[SU4] Assessment of ability to use methods and tools	
	[K7_W07] has knowledge on the development perspectives of ocean technology objects and systems, knows the newest and most relevant achievements in ocean technology		The student will gain knowledge about the currently used supporting structures and will know the development trend of these structures.			[SW1] Assessment of factual knowledge	
	[K7_U07] in compliance with a formulated specification and with the aid of appropriate tools and methods, is able to complete an advanced engineering task within the range of design, construction and operation of ocean technology objects and systems		The student will learn the basic methods used in the process of designing supporting structures			[SU4] Assessment of ability to use methods and tools	
	K7_W04		The student will learn the software for modeling the geometry of floating objects and hydrostatic analyses.			[SW1] Assessment of factual knowledge	

Subject contents	1. Mooring systems 1.1 Types of mooring systems 1.2 Mooring systems modelling 2. Mechanics of motion of a floating wind turbine 2.1 Static solutions for TLP 2.2 Introduction to the dynamics of floating platforms. The equations of motion 3. Seabed impact modelling 3.1 Simplified model for monopile structures 3.2 Simplified model for gravity structures 3.3 Layer model P-y 4. Single-degree of freedom structures 4.1 Equation of motion 4.2 Determining the coefficients of the equation of motion and the force acting on a "concentrated mass" 4.3 Determining the system's natural frequency 5. Multi-degree of freedom structures. Lumped mass model 5.1 (Matrix) equation of motion 5.2 Determination of mass matrix elements, stiffness matrix and damping matrix. 5.3 Determination of forces acting on (lumped) masses. 5.4 Determination of structures eigenfrequencies		
Prerequisites and co-requisites	1. Basic knowledge of surface design software for floating objects, such as: - Freeshipping or - Maxsurf or - NAPA 2. Basic knowledge of hydromechanics of floating objects (stability, dynamic forces) 3. Completion of the course: Offshore Support Structures I		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		0.0%	0.0%
Recommended reading	Basic literature		
	Supplementary literature		
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		