



## Subject card

Subject name and code	, PG_00058888						
Field of study	Ocean Engineering						
Date of commencement of studies	February 2023	Academic year of realisation of subject				2023/2024	
Education level	second-cycle studies	Subject group					
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	Zakład Mechaniki Konstrukcji Oceanotechnicznych -> Institute of Ocean Engineering and Ship Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Wojciech Puch				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	0.0	30.0	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	0.0		0.0		30
Subject objectives	Getting to know the issues of the hull vibrations and the propulsion system of the ship and the methods for determining the sensitivity of the ship's hull and its propulsion system to vibration.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[K7_W05] has an organized, widened knowledge on design, construction and operation of ocean technology objects and systems		Student has a knowledge in the domain of mechanical vibrations and modal analysis.			[SW1] Assessment of factual knowledge	
	[K7_W06] has an organized, widened knowledge on engineering methods and design tools allowing the conducting of advanced projects within the construction and operation of ocean technology objects and systems		Student selects the appropriate methods and computer programs to determine the natural frequencies of vibration hull structure of the ship and torsional vibrations of the shaft.			[SW3] Assessment of knowledge contained in written work and projects	
	[K7_U06] when forming and solving design tasks can see their non-technical aspects, including environmental, economical and legal ones. Applies HSE rules and regulations		Student knows how to use Rules and Regulations in the domain of hull vibrations.			[SU3] Assessment of ability to use knowledge gained from the subject	
Subject contents	<p>The unification of concepts from the subject of vibration theory.</p> <p>Natural vibrations of systems with many degrees of freedom and continuous systems.</p> <p>The influence of rotational inertia and shear deformation on the vibration of hull.</p> <p>Effect of hydrodynamic reaction on the hull vibration.</p> <p>Determination of the inertia of working machines and equipment.</p> <p>Torsional, longitudinal and flexural vibrations of rotating shafts.</p> <p>Reduction of stiffnesses and masses of the engine shaft system.</p> <p>Prevention of ship vibration.</p>						
Prerequisites and co-requisites	<p>Fundamentals of knowledge about mechanical vibrations: free and forced vibrations of a system with one degree of freedom and with many degrees of freedom and continuous systems.</p> <p>Basics of knowledge about dynamic interactions of structures with fluid.</p>						
Assessment methods and criteria	Subject passing criteria		Passing threshold			Percentage of the final grade	
	Report		55.0%			70.0%	
	Paper&Lecture		66.0%			30.0%	
Recommended reading	Basic literature		W.S. Vorus: Vibration. (in: Principles of Naval Architecture, vol. II. Society of Naval Architects and Marine Engineers, 1988.)				

	Supplementary literature	Prevention of Vibration in Ships. Informative Publication no. 2/I, Polski Rejestr Statków PRS, Gdańsk 2004. Practical guide for shipboard vibration control and attenuation (SSC-330). Ship Structure Committee, 1990.
	eResources addresses	
Example issues/ example questions/ tasks being completed	Determination of the frequency of flexural natural vibrations of a free beam. Determination of the frequency of torsional natural vibrations of a dual mass system. Vibration measurements on ships. Incorrect and correct design solutions due to vibration propagation on ships.	
Work placement	Not applicable	