



Subject card

Subject name and code	Seaworthiness, PG_00045120						
Field of study	Ocean Engineering						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2024/2025		
Education level	first-cycle studies	Subject group					
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	3	Language of instruction			Polish		
Semester of study	6	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Hydromechanics and Hydroacoustics -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Paweł Dymarski					
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	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		3.0		17.0	50
Subject objectives	<p>The aim of the course is to provide students with knowledge of the seakeeping of a ship. Seakeeping is a branch of the ship theory that describes the behavior of a ship exposed to waves and wind and the influence of these conditions on the ship's navigability.</p> <p>As part of the course, the student will learn:</p> <ul style="list-style-type: none">- basic models describing the dynamics of the marine environment- equations governing the movement of the ship (or floating object) -- methods of determining the forces of environmental impact on the ship- ways of conducting model research and analyzing the obtained results.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W08] has knowledge of the principles of sustainable development	n.d.			[SW1] Assessment of factual knowledge		
	[K6_W06] has an organized knowledge on engineering methods and design tools allowing the conducting of projects within the construction and operation of ocean technology objects and systems	Has knowledge of the methods used to analyze the ship seakeeping.			[SW1] Assessment of factual knowledge		

Subject contents	<p>1. Omów znane Ci funkcje widma falowania morskiego. Omów parametry niezbędne do określenia funkcji widma</p> <p>2. Stacjonarny model wiatru</p> <p>3. Niestacjonarny model wiatru.</p> <p>4. Omów (nazwij) ruchy statku na poszczególnych stopniach swobody.</p> <p>5. Sformułuj równanie nurzań/kotyśań bocznych statku. Omów poszczególne człony równania</p> <p>6. Siły działające na statek/obiekt offshore</p> <p>7. Badania modelowe: co to jest charakterystyka amplitudowa (RAO)? Omów sposób uzyskiwania charakterystyki amplitudowej w oparciu o badania modelowe an przykładzie nurzań/kotyśań wzdłużnych statku.</p> <p>8. Wyznacz widmo nurzań dla zadanej charakterystyki amplitudowej oraz widma falowania</p>								
Prerequisites and co-requisites	<p>Basic knowledge of ship theory and fluid mechanics, in particular</p> <ul style="list-style-type: none"> - basic knowledge of flotation (flotation equation - Archimedes' law) - basic knowledge of stability in terms of the metacentric formula - flow continuity equation, Bernoulli equation - basic information about sea waves <p>- understanding of Newton's second law</p>								
Assessment methods and criteria	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">Subject passing criteria</th> <th style="width: 30%;">Passing threshold</th> <th style="width: 30%;">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td>Lecture (Test)</td> <td>60.0%</td> <td>100.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Lecture (Test)	60.0%	100.0%
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Recommended reading	Basic literature	<p>[1] Jan Dudziak Teoria okrętu</p> <p>[2] A.R.J.M Lloyd: Seakeeping ship behaviur in rough weather</p>							
	Supplementary literature	<p>[3] O.M. Faltinsen Sea Loads on Ships and Offshore Structures</p> <p>[4] J.M.J. Journée, W.W. Massie Offshore Hydromechanics</p> <p>[5] Principles of Naval Architecture vol. 3</p>							
	eResources addresses	Adresy na platformie eNauczanie:							
Example issues/ example questions/ tasks being completed	<p>1. Describe the known functions of the wave spectrum. Discuss the parameters necessary to determine the function of the spectrum</p> <p>2. Stationary wind model</p> <p>3. Non-stationary wind model.</p> <p>4. Discuss (name) the ship's movements on individual degrees of freedom.</p> <p>5. Formulate the ship's heve / roll equation. Discuss the individual components of the equation</p> <p>6. Forces acting on the ship / offshore structures</p> <p>7. Model testing: what is an amplitude response operator (RAO)? Describe the method of obtaining the amplitude characteristics based on model tests on the example of a ship's heave / roll motion.</p> <p>8. Determine the heave spectrum for the given amplitude characteristics and the given wave spectrum</p>								
Work placement	Not applicable								