



## Subject card

Subject name and code	Hydromechanics of Ship, PG_00045052						
Field of study	Ocean Engineering						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2023/2024		
Education level	first-cycle studies	Subject group					
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	2	Language of instruction			Polish		
Semester of study	4	ECTS credits			3.0		
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 inż. Michał Krężelewski				
	Teachers		dr inż. Michał Krężelewski dr inż. Ewelina Ciba				
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	The student recognizes basic problems connected with flows and flows around bodies. Uses the laws and methods of hydromechanics and can apply them to ship and ocean structures.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W03] has a basic knowledge on hydromechanics, thermodynamics, machine construction, ecology, materials science and electronics necessary to understand the construction and operation principles of ocean technology objects and equipment	The student recognizes basic problems connected with flows and flows around bodies. Uses the laws and methods of hydromechanics and can apply them to ship and ocean structures.			[SW1] Assessment of factual knowledge		
	[K6_W05] has an organized knowledge on design, construction and operation of ocean technology objects and systems	The student recognizes basic problems connected with flows and flows around bodies. Uses the laws and methods of hydromechanics and can apply them to ship and ocean structures.			[SW1] Assessment of factual knowledge		
	[K6_U05] can formulate a simple engineering task and its specification within the range of design, construction and operation of ocean technology objects and systems	The student recognizes basic problems connected with flows and flows around bodies. Uses the laws and methods of hydromechanics and can apply them to ship and ocean structures.			[SU4] Assessment of ability to use methods and tools		
Subject contents	Surface forces. Boundary layer and hydrodynamic wake. The similarity of flows and modeling laws. Ship resistance. Basic field theory. Field operators: gradient, velocity flux, divergence, rotation and circulation of velocity. Mass conservation equation. Basic wing theory: geometrical and hydrodynamic characteristics of foils, Kutta - Joukowski theorem. Motion of fluids: Lagrange and Euler approach. Navier- Stokes equation. Reynolds Average Navier Stokes equations (RANS). Turbulence and its models. Basics of Computational Fluid Dynamics (CFD). Potential flows. Gravity waves.						
Prerequisites and co-requisites	Fluid Mechanics						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Lecture		50.0%		50.0%		
	Laboratory		100.0%		50.0%		

Recommended reading	Basic literature	<p>Dudziak J. Teoria Okrętu, 2008 Gdańsk</p> <p>Krężelewski M. Hydromechanika ogólna i okrętowa, skrypt PG Tom I , II, Gdańsk 1982</p>
	Supplementary literature	<p>Journee J., Massie W. Offshore Hydromechanics, Delft University of Technology, January 2001</p> <p>Newman J.N., Marine Hydrodynamics, MIT Press, 2017</p>
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	