GDAŃSK UNIVERSITY OF TECHNOLOGY

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 Kręrzelewski				
	Teachers		dr inż. Michał Kręrzelewski 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). Turblulence 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%
	Labolatory	100.0%	50.0%

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