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 2021	Academic year of realisation of subject	2022/2023
Education level	first-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	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. Ewelina Ciba dr inż. Michał Krężelewski	

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_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
[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_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

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

<table>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Labolatory</td><td>100.0%</td><td>50.0%</td></tr>
<tr><td>Lecture</td><td>50.0%</td><td>50.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>Dudziak J. Teoria Okrętu, 2008 Gdańsk

Krężelewski M. Hydromechanika ogólna i okrętowa, skrypt PG Tom I , II, Gdańsk 1982</td></tr>
<tr><td>Supplementary literature</td><td>Journee J., Massie W. Offshore Hydromechanics, Delft University of Technology, January 2001

Newman J.N., Marine Hydrodynamics, MIT Press, 2017</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:
Hydromechanika okrętu, PG_00045052 Oceanotechnika sem. 4 letni 22/23 - Moodle ID: 29748
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=29748</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2"></td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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