



## Subject card

Subject name and code	Resistance and Stability of Yacht, PG_00060606						
Field of study	Design and Construction of Yachts						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2026/2027		
Education level	first-cycle studies		Subject group		Obligatory subject group in the field of study 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		10.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Institute Of Naval Architecture -> Faculty Of Mechanical Engineering And Ship Technology -> Wydział Politechniki Gdańskiej						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Przemysław Krata				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	30.0	30.0	30.0	0.0	120
	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	120		12.0		118.0	250
Subject objectives	The aim of the course is to provide a solid foundations of knowledge in yacht stability and hull resistance						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U05] able to formulate a simple engineering task and its specification in the field of yacht design, construction, and operation		A student is able to assess the stability of an intact yacht and determine the hull resistance for design purposes.		[SU1] Assessment of task fulfilment		
	[K6_W03] has knowledge of hydromechanics, thermodynamics, machine design, ecology, materials science necessary to understand the principles of construction and operation of ocean engineering facilities and equipment		A student gains knowledge of the phenomena relevant to yacht hull resistance and contemporary methods for modeling of them.		[SW1] Assessment of factual knowledge		
	[K6_W02] has knowledge in the field of technical mechanics, fluid mechanics, strength of materials, necessary to understand the basic physical phenomena occurring in ocean engineering		A student gains knowledge of the phenomena relevant to yacht stability assessment and contemporary methods for modeling of them.		[SW1] Assessment of factual knowledge		
Subject contents	<ul style="list-style-type: none"><li>• Equilibrium of a free-floating vessel.</li><li>• Measures of initial stability of a yacht; determination of small static angle of heel.</li><li>• Static stability at large angles of heel; determination of large static angle of heel.</li><li>• Dynamic stability of a ship; determination of dynamic heel angle.</li><li>• Effects of suspended loads and free surfaces of fluids on yacht stability.</li><li>• Intact ship stability assessment based on prescriptive criteria.</li><li>• Longitudinal forces on a yacht sailing with a steady course.</li><li>• Components of hull resistance.</li><li>• Methods of determination of hull resistance.</li></ul>						

Prerequisites and co-requisites	Background of physics and mathematics.		
	Well-established in the basics of yacht hydromechanics.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Final test	50.0%	100.0%
Recommended reading	Basic literature	Marchaj Cz., Sailing Theory and Practice	
		Marchaj Cz., Seaworthiness: the forgotten factor	
		Ruponen P., Principles of Ship Buoyancy and Stability.	
		Derrett D. R., Barrass C. B., Ship Stability for Masters and Mates	
Recommended reading	Supplementary literature	Rawson K.J., Tupper E. C.,Basic Ship Theory.	
		Matusiak J., Dynamics of a Rigid Ship - with applications.	
		Lewis, E. V. (ed): Principles of Naval Architecture.	
		Hirdaris, S., Lecture Notes on Basic Naval Architecture.	
Recommended reading	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	Assess whether a vessel in a given loading condition meets the criteria by Classification Societies relevant for yachts.		
	Calculate STIX index		
	Determine the resistance curve of a given yacht's hull.		
Work placement	Not applicable		

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