



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 2026	Academic year of realisation of subject				2027/2028	
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 -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Przemysław Krata					
	Teachers						
Lesson types	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_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		
	[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		
Subject contents	<p>Course content – lecture</p> <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  Rawson K.J., Tupper E. C., Basic Ship Theory.	
	Supplementary literature	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.	
	eResources addresses		
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.		
Practical activities within the subject	Not applicable		

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