GDAŃSK UNIVERSITY OF TECHNOLOGY

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 2023	Academic year of realisation of subject	2024/2025
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 -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Przemysław Krata	
	Teachers	mgr inż. Olga Kazimierska dr inż. Anna Kozłowska mgr inż. Katarzyna Warnke-Olewniczak prof. dr hab. inż. Janusz Kozak dr hab. inż. Przemysław Krata dr inż. Michał Krężelewski	

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 it to provide a solid foundations of knowledge in yacht stability and hull resistance

Learning outcomes

Course outcome	Subject outcome	Method of verification
[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_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, as well as select a proper screw propeller.	[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 its propulsion along with familiarization with contemporary methods for modeling of them.	[SW1] Assessment of factual knowledge

Subject contents	• Equilibrium of a free-floating vessel. • Measures of initial stability of a yacht; determination of small static angle of heel. • Static stability at large angles of heel; determination of large static angle of heel. • Dynamic stability of a ship; determination of dynamic heel angle. • Effects of suspended loads and free surfaces of fluids on yacht stability. • Intact ship stability assessment based on prescriptive criteria. • Longitudinal forces on a yacht sailing with a steady course. • Components of hull resistance. • Methods of determination of hull resistance. • Theory behind screw propellers. • Ship screw propellers characteristics. • Propeller selection for a yacht with given characteristics.
Prerequisites and co-requisites	Background of physics and mathematics. Well-established in the basics of yacht hydrostatics.

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	Podstawowe https://aaltodoc.aalto.fi/handle/123456789/61 - Aalto University textbooks repository Uzupełniające Adresy na platformie eNauczanie: Opór i stateczność jachtu - Moodle ID: 43111 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=43111
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. Select a proper screw propeller to a given yacht.	
Work placement	Not applicable	

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