GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Ship Resistance and Stability, PG_00060539		
Field of study	Naval Architecture and Offshore Structures		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2027/2028
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	9.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Ship Design - None (Existed Previously) -> 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	45.0	30.0	30.0	15.0	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	93.0	225

Subject objectives

The aim of the course it to provide a solid foundations of knowledge in ship stability and hull resistance

Learning outcomes

Course outcome	Subject outcome	Method of verification
[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 ship hull resistance and contemporary methods for modeling of them.	[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	A student is able to assess the stability of an intact ship 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 ship stability assessment and contemporary methods for modeling of them.	[SW1] Assessment of factual knowledge

<table>
<tr><td>Subject contents</td><td>Course content – lecture
Equilibrium of a free-floating vessel.

Measures of initial stability of a ship; 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 ship stability.

Intact ship stability assessment based on prescriptive criteria.

Longitudinal forces on a ship sailing with a steady course.

Components of hull resistance.

Methods of determination of hull resistance.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Background of physics and mathematics.

Well-established in the basics of ship hydromechanics.</td></tr>
<tr><td>Assessment methods and criteria</td><td><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>Final test</td><td>50.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td>Recommended reading</td><td><table><tr><td>Basic literature</td><td>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.</td></tr><tr><td>Supplementary literature</td><td>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.</td></tr><tr><td>eResources addresses</td><td></td></tr></table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>Assess whether a vessel in a given loading condition meets the IS Code criteria.

Determine the resistance curve of a given ship's hull.</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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