GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Advanced methods of hull design, PG_00062674						
Field of study	Naval Architecture and Offshore Structures						
Date of commencement of studies	February 2024		Academic year of realisation of subject	2024/2025			
Education level	second-cycle studies		Subject group	Specialty 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	1		Language of instruction	Polish			
Semester of study	2		ECTS credits	5.0			
Learning profile	general academic profile		Assessment form	assessment			
Conducting unit	Zakład Projektowania Okrętu -> Institute of Ocean Engineering and Ship Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Tomasz Hinz				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	45.0	0.0	75
	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	75		10.0	40.0		125
Subject objectives	Demonstration of modern ship design methods						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_U02] Presents convincing and logically justified arguments regarding outcomes through critical analysis of information in diverse technical contexts and an approach to their interpretation	The student can analyse and present the results of the calculations required in the design process.	[SU5] Assessment of ability to present the results of task [SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment
[K7_U01] Develops innovative strategies to solve complex and dynamic problems by synthesizing information from various sources and utilizing analytical, simulation, and experimental methods, considering environmental variability	The student can collect relevant data and make engineering calculations under uncertainty based on assumptions	[SU1] Assessment of task fulfilment
[K7_W02] Explains the essence and relationships of key components describing systems and processes in ocean engineering, utilizing current knowledge from major scientific fields related to the field of study	The student can link information from different fields within a multidisciplinary field, such as a ship design.	[SW3] Assessment of knowledge contained in written work and projects
[K7_W06] Capable of finding and utilizing credible sources of information crucial for analyzing issues within the field of study	Students will be able to find and use the statistical data required to complete the project.	[SW3] Assessment of knowledge contained in written work and projects
[K7_W03] Demonstrates advanced skills in applying analytical methods and problem-solving techniques related to ocean engineering, using appropriate tools	Students will be able to make an economic analysis of the construction and operating costs of ships needed to select the best ship option	[SW3] Assessment of knowledge contained in written work and projects
[K7_K01] Understands the need for lifelong learning, critically evaluate acquired knowledge, and comprehend the significance of knowledge in addressing cognitive and practical problems	The student demonstrates an understanding of the idea of development of science and technology.	[SK4] Assessment of communication skills, including language correctness

Subject contents

Top-down approach, including similar ships, regressions and previous projectsBottom-up approach , including Design Building Blocks, Packing approach and system-based approaches"What-if" scenarios (epoch-era matrix)Risk Based Ship Design

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Project	50.0%	100.0%

Recommended reading

Basic literature

Papanikolaou, Apostolos, ed. *Risk-Based Ship Design*. Berlin, Heidelberg: Springer Berlin Heidelberg, 2009. https://doi.org/10.1007/978-3-540-89042-3.Ship Design under Uncertainty. PhD Thesis, Norwegian University of Science and Technology, 2018.Oers, Bart van, Douwe Stapersma, and Hans Hopman. A 3D Packing Approach for the Early Stage Configuration Design of Ships. In *9th International Conference on Computer and IT Applications in the Maritime Industries*. Gubbio, Italy, 2010.Papanikolaou, Apostolos, ed. *A Holistic Approach to Ship Design: Volume 1: Optimisation of Ship Design and Operation for Life Cycle*. Cham: Springer International Publishing, 2019. https://doi.org/10.1007/978-3-030-02810-7., ed. *A Holistic Approach to Ship Design: Volume 2: Application Case Studies*. Springer International Publishing, 2021. https://doi.org/10.1007/978-3-030-71091-0.

	Supplementary literature	Papanikolaou, Apostolos. Ship Design Methodologies of Preliminary Design. Dordrecht: Springer Netherlands, 2014. https://doi.org/10.1007/978-94-017-8751-2.Roh, Myung-Il, and Kyu-Yeul Lee. Computational Ship Design. Singapore: Springer Singapore, 2018. https://doi.org/10.1007/978-981-10-4885-2.Andrews, David. 100 Things (or so) a Ship Designer Needs to Know. In Day 2 Mon, June 27, 2022, D021S001R001. Vancouver, Canada: SNAME, 2022. https://doi.org/10.5957/IMDC-2022-230.Andrews, D.J. A Comprehensive Methodology for the Design of Ships (and Other Complex Systems). Proceedings of the Royal Society of London. Series A: Mathematical, Physical and Engineering Sciences 454, no. 1968 (January 8, 1998): 187211. https://doi.org/10.1098/rspa.1998.0154.Kondratenko, Aleksander, and Pentti Kujala. A Framework for Multi-Objective Optimization of Arctic Offshore Support Vessels, A Risk-Based Approach to Optimal Margins in Ship Design. PhD Thesis, MASSACHUSETTS INSTITUTE OF TECHNOLOGY, 2002.Mermiris, Georgios Apostolou. A RISK-BASED DESIGN APPROACH TO SHIP SHIP COLLISION. PhD Thesis, Universities of Glasgow and Strathclyde, 2010.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	Conduct and present selected design calculations.	
Work placement	Not applicable	

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