GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Introduction to Ship Design, PG_00060537
Field of study	Naval Architecture and Offshore Structures

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 For interested students, it is possible to choose an individual topic for the design of a vessel other than a multi-purpose general cargo ship.
Semester of study	3	ECTS credits	7.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Institute of Ocean Engineering and Ship Technology -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Cezary Żrodowski	
	Teachers		

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	45.0	0.0	0.0	30.0	0.0	75
	E-learning hours included: 0.0						
	Additional information: Possible credit based on the projects of watercraft carried out as part of the work of the scientific club KSTO KORAB						

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	8.0	92.0	175

Subject objectives	Introduction to: 1. Naval architecture and hull structure design theory 2. Practical implementation of the design process 3. Professional vocabulary in Polish and English 4. Most important software tools Implementation of a parametric project at the concept level.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U01] can obtain information from literature, databases and other sources, can verify and organize the obtained information, interpret them and form conclusions and justified opinions	The student is able to analyze the constrains of the shipping route of the designed vessel, based on independently selected, publicly available sources.	[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task
	[K6_W06] has an organized knowledge on engineering methods and design tools allowing the conducting of projects within the construction and operation of ocean technology objects and systems	The student is able to choose the appropriate CAD program for the implementation of the indicated phase of the design process, and describe its advantages and disadvantages in relation to other available solutions.	[SW2] Assessment of knowledge contained in presentation
	[K6_W05] has an organized knowledge on design, construction and operation of ocean technology objects and systems	The student knows and implements the ship design process, described by the Evans spiral and hers younger derivatives (V-model)	[SW3] Assessment of knowledge contained in written work and projects
	[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	The student is able to formulate equations of basic design balances, based on descriptive functional requirements.	[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject

Subject contents	
	1. Organization of the maritime industry, activities of IMO and TK, legal aspects of shipbuilding and operation (conventions, local law). 2. Systematics of types of vessels, functional requirements and constrains. 3. Genesis of ship design theory methods and design evaluation criteria 4. Mathematical modelling, idealization of problems and algorithmizing of the methodology of the ship design process. 5. Tools useful to support design work. 6. Iterative nature of the initial design process of ships design spiral stages of parametric and geometric design. 7. Professional terminology used in the Polish shipbuilding industry, defining basic concepts and parameters used in ship design. 8. Principles of ship design calculations, units of measurement, mathematical structural and non-structural models, clear presentation of calculations and charting. 9. Selected physical laws, theoretical and empirical analytical relationships used in the methodology of preliminary design of ships and yachts. 10. Introduction to the issues of determining design solutions that meet the criteria of functionality and technical safety of ships and yachts. 11. Formulation of basic balance equations and design constraints for cargo ships and recreational yachts. 12. Designing the main parameters of the ship on the example of a multipurpose general cargo ship. 13. Principles of dividing the hull interior into compartments. 14. Calculations checking the buoyancy, initial stability and registered tonnage of the designed ship 15. Materials used in hull construction, corrosion and corrosion protection, welded joints 16. Construction of popular ship types 17. Ship hull loads. Stresses in structural elements (local, general and zone strength) 18. Other strength criteria (fatigue life, buckling of structural elements) 19. Construction of particular areas of the hull (bottom, decks, sides, bulkheads, extreme parts of the hull, other selected elements (e.g. foundations))

Prerequisites and co-requisites	
	Basic ability to use MS Office programs (Word and Excel) and the ability to make a drawing of the General Plan in any CAD program.Knowledge of one of the parametric 3D CAD systems recommended

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Written test passing the lecture	50.0%	50.0%
	Project	75.0%	50.0%

Recommended reading	Basic literature	1. Papanikolaou A.: Ship Design, Methodologies of Preliminary Design, Springer Netherlands, 2014 2. Michalski J.P.: Podstawy teorii projektowania okrętów. Wydawnictwo PG, 2013 3. Staszewski J., Paczesniak J.: Projektowanie Okretów, I, II, III tom, skrypt Politechniki Gdańskiej. 4. Buczkowski L.: Podstaw Budownictwa Okrętowego, I, II, III tom, skrypt Politechniki Gdańskiej. 5. Milewski J.: Projektowanie i budowa jachtów żaglowych. Gdynia 1998
	Supplementary literature	1. Watson D.: Practical ship design , Amsterdam, Elsevier, 1998 2. Schneekluth H.: Ship design for efficiency and economy, London,Butterworths, 1987. 3. Piskorz-Nałecki J.: Projektowanie statków morskich. Szczecin, Wyd. PS, 1982. 4. Semenov I., Sanecka K.: Teoria projektowania statków, Szczecin, Wyd. PS, 2001.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	Test: 1. Podaj definicję i nazwę w języku angielskim: owrężą, tonażu rejestrowego, podoblenia. 2. Jaki wpływ ma kształt dziobu na dzielnośc morksą statku? 3. Co projektant może zrobić w przypadku braku/nadmiaru wolnej burty?	
Work placement	Not applicable	