GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00062012		
Field of study	Projektowanie okrętów i obiektów oceanotechnicznych		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2025/2026
Education level	first-cycle studies	Subject group	
Mode of study	Part-time studies	Mode of delivery	at the university
Year of study	3	Language of instruction	Polish
Semester of study	5	ECTS credits	8.0
Learning profile	general academic profile	Assessment form	assessment
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 inż. Cezary Żrodowski	
	Teachers	dr inż. Cezary Żrodowski	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	36.0	0.0	9.0	18.0	0.0	63

E-learning hours included: 0.0

eNauczanie source addresses:

Moodle ID: 2062 Podstawy projektowania okrętów (PG_00060537), W, P, OiKM, sem. 3, zimowy, 2025/2026
https://enauczanie.pg.edu.pl/2025/course/view.php?id=2062

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	63	0.0	0.0	63

Subject objectives

Introduction to:
1. Theory of ship design and construction and ocean engineering objects.
2. Practical implementation of the design process.
3. Professional vocabulary in Polish and English.
4. Key software tools.
5. Implementation of parametric design at the concept level.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W11] has knowledge of analysis, design, technology and manufacturing of selected technical systems, machinery and equipment, metrology and quality control, knows and understands methods of measurement and calculation of basic quantities describing the operation of technical systems, knows basic calculation methods used to analyse experimental results	The student designs, performs and interprets the results of model tests of a ship's hull or ocean engineering objects.	[SW1] Ocena wiedzy faktograficznej [SW2] Ocena wiedzy zawartej w prezentacji
[K6_U03] is able to identify, formulate and develop the documentation of a simple design or technological task, including the description of the results of this task in Polish or in a foreign language and to present the results using computer software or other aiding tools	The student performs basic calculations and drawings for the conceptual design stage of a ship or ocean engineering objects.	[SU1] Ocena realizacji zadania [SU4] Ocena umiejętności korzystania z metod i narzędzi
[K6_U14] is able to analyse the operation of devices and compare the construction solutions applying usage, safety, environmental, economic and legal criteria	The student carries out a conceptual design of a ship or ocean engineering objects, based on the regulations of classification societies and IMO conventions.	[SU1] Ocena realizacji zadania [SU2] Ocena umiejętności analizy informacji
[K6_W08] has a knowledge of the analysis and design of selected technical systems, machines and technical equipment, selection of construction materials, manufacturing and operation, including their life cycle	The student knows and implements the ship design process described by the Evans spiral and its younger derivatives (V model)	[SW3] Ocena wiedzy zawartej w opracowaniu tekstowym i projektowym

Subject contents

Lecture:
1. Organization of the maritime industry, activities of the IMO and Classification Societes, legal aspects of ship structure and operation (conventions, local law).
2. Systematics of vessel types, functional requirements, and constraints.
3. Origins of ship design theory methods and design evaluation criteria.
4. Mathematical modeling, idealization of problems, and algorithmization of ship design methodology.
5. Tools useful for supporting design work.
6. Iterative nature of the preliminary ship design process: design spiral, parametric and geometric design stages.
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, structural and unstructured mathematical models, clear presentation of calculations, and graphing.
9. Selected physical laws, theoretical, and empirical analytical relationships used in the preliminary design methodology of ships and yachts.
10. Introduction to determining design solutions that meet the functional and technical safety criteria of ships and yachts. Formulating basic balance equations and design constraints for transport vessels and recreational yachts.
11. Principles of compartmentation of the hull.
12. Calculations verifying the buoyancy, initial stability, and registered tonnage of the designed ship.
13. Design of common ship types.
14. Materials used in hull construction, corrosion and corrosion protection, welded joints.
15. Hull loads. Stresses in structural elements (local, general, and zone strength).
16. Other strength criteria (fatigue life, buckling of structural elements).
17. Design of individual hull areas (bottom, decks, sides, bulkheads, outer hull sections, other selected elements (e.g., foundations).

Project:
1. Design of the main ship parameters using the example of a multipurpose general cargo ship.
2. Creation of a theoretical line drawing.
3. Preparation of a Master Plan.

Laboratory:
1. Model tests covering the stability and resistance properties of the hull.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
	50.0%	50.0%
	50.0%	25.0%
	50.0%	25.0%

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	
Example issues/ example questions/ tasks being completed	Lecture: Provide definitions of: 1. hull block coefficient, 2. freeboard, 3. registered tonnage Project: Design of a multi-purpose general cargo ship, with presentation of results. Laboratory: Presentation of results of measurements performed in the laboratory (stability, resistance)	
Practical activites within the subject	Not applicable	

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