



Subject card

Subject name and code	, PG_00062012						
Field of study	Mechanical and Naval Engineering						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2026/2027		
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 -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Cezary Żrodowski					
	Teachers						
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						
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_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] Assessment of knowledge contained in written work and projects		
	[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] Assessment of task fulfilment [SU2] Assessment of ability to analyse information		
	[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] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools		
	[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] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation		

Subject contents	Course content – lecture													
	<ol style="list-style-type: none"> 1. Organization of the maritime industry, activities of the IMO and Classification Societies, 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. Principles of compartmentation of the hull. 11. Calculations verifying the buoyancy, initial stability, and registered tonnage of the designed ship. 12. Design of common ship types. 													
	Course content – laboratory													
	<ol style="list-style-type: none"> 1. Model tests covering the stability of the hull. 2. Model tests covering the resistance properties of the hull. 3. Model tests of propeller. 													
Prerequisites and co-requisites	Course content – project													
	<ol style="list-style-type: none"> 1. Design of the main ship parameters using the example of a multipurpose cargo ship. 2. Creation of theoretical lines drawing. 3. Preparation of General Arrangement drawing. 													
	Assessment methods and criteria													
	<table border="1"> <thead> <tr> <th>Subject passing criteria</th> <th>Passing threshold</th> <th>Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td></td> <td>50.0%</td> <td>25.0%</td> </tr> <tr> <td></td> <td>50.0%</td> <td>25.0%</td> </tr> <tr> <td></td> <td>75.0%</td> <td>50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade		50.0%	25.0%		50.0%	25.0%		75.0%
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Recommended reading	Basic literature	<ol style="list-style-type: none"> 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 Okrętów, 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	<ol style="list-style-type: none"> 1. Watson D.: Practical ship design , Amsterdam, Elsevier, 1998 2. Schneekluth H.: Ship design for efficiency and economy, London, Butterworths, 1987. 3. Piskorz-Nalecki 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	<p>Lecture: Provide definitions of:</p> <ol style="list-style-type: none"> 1. hull block coefficient, 2. freeboard, 3. registered tonnage <p>Project: Design of a multi-purpose general cargo ship, with presentation of results.</p> <p>Laboratory: Presentation of results of measurements performed in the laboratory (stability, resistance)</p>												
Practical activities within the subject	Not applicable													

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