

## 关。GDAŃSK UNIVERSITY 创 OF TECHNOLOGY

## Subject card

Subject name and code	Application of Optimization Methods in Design, PG_00056273								
Field of study	Design and Construction of Yachts								
Date of commencement of studies	October 2022		Academic year of realisation of subject			2024/2025			
Education level	first-cycle studies		Subject group						
Mode of study	Full-time studies		Mode of delivery			at the university			
Year of study	3		Language of instruction			English			
Semester of study	6		ECTS credits			2.0			
Learning profile	practical profile		Assessment form			assessment			
Conducting unit	Department of Theory and Ship Design -> Faculty of Mechanical Engineering and Ship Technology						logy		
Name and surname	Subject supervisor	Subject supervisor dr inż. Cezary Żrodowski							
of lecturer (lecturers)	Teachers								
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	t	Seminar	SUM	
	Number of study hours	0.0	0.0	30.0 0.0			0.0	30	
	E-learning hours included: 0.0								
	Address on the e-learning platform: https://enauczanie.pg.edu.pl/moodle/course/view.php?id=13810								
	The lecture can be provided in remote mode in case of necessity.								
Learning activity and number of study hours	Learning activity	Participation in classes includ plan	n didactic ed in study	Participation in consultation hours		Self-study		SUM	
	Number of study 30 hours			3.0		17.0		50	
Subject objectives	Introduction to basic optimization techniques, used in context of computer aided design process. Activities cover parametric, boundary and topology optimization of 3D CAD geometry, based on defined structure loads.								
Learning outcomes	Course outcome		Subject outcome			Method of verification			
	K6_W04		The student knows the basic CAD / CAE / MDO tools and is able to use them to implement simple engineering tasks.			[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge			
	K6_W03		The student carries out complex, interdisciplinary project optimization tasks.			[SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation			
	K6_U05		The student formulates optimization tasks, selects the right tools to solve them and presents the results.			[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment			
	K6_W06		The student presents the knowledge of the systematics of methods and IT tools used to optimize yacht designs based on FEM and CFD analyzes		[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge				
Subject contents	Introduction to optimization theory (systematic, random, gradient and evolutionary methods) Optimization of 3D geometry (parametric, boundary, topology)								
	Project of optimization of simple 3D part using 3D CAD and Model Center								
Prerequisites and co-requisites	Parametric 3D modelling								

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade		
	Work progress	50.0%	25.0%		
	Project completion	50.0%	75.0%		
Recommended reading	Basic literature	Practical Aspects of Finite Element Simulation; Altair University, 3rd edition 03/2015 Practical Aspects of Structural Optimization - a Study Guide; 2nd edition 0362015			
	Supplementary literature Siemens NX - User Guide   Model Center - User Guide				
	eResources addresses	dresses Adresy na platformie eNauczanie:			
Example issues/ example questions/ tasks being completed	Topology optimization of ship hull bracket. Parametric optimization of ship hull dimensions, based od predefined model.				
Work placement	Not applicable				