

。 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Manufacturing of Composite Hull, PG_00060613								
Field of study	Design and Construction of Yachts								
Date of commencement of studies	October 2023		Academic year of realisation of subject			2025/2026			
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	3		Language of instruction			Polish Classes in cooperation with industrial partners, about 30% carried out at the partners' premises.			
Semester of study	5		ECTS credits			6.0			
Learning profile	general academic profile		Assessment form			assessment			
Conducting unit	Institute of Naval Arch	nitecture -> Fac	culty of Mechar	nical Engineerii	ng and S	Ship Te	chnology		
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Cezary Żrodowski						
	Teachers								
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
	Number of study hours	30.0	0.0	0.0	30.0		15.0	75	
	E-learning hours included: 0.0								
Learning activity and number of study hours	Learning activity Participation ir classes include plan		I didactic Participation in consultation hours		Self-study		SUM		
	Number of study hours	75		8.0		67.0		150	
Subject objectives	Familiarizing students with the basic principles of composite yacht hull construction technology, which is dominant in the modern yacht industry.								
Learning outcomes	Course outcome		Subject outcome			Method of verification			
	[K6_W06] has well-organised knowledge of engineering methods and design tools enabling the conducting of projects in the field of construction and operation of yachts		The student correctly selects the methods and supporting CAD/ CAE tools to solve the given problem in the design and manufacture of a composite hull.			[SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation			
	[K6_U06] able to perform basic engineering tasks in the field of yacht design, construction and operation according to the formulated specification, using appropriate methods and tools		The student correctly performs the design task covering issues related to the manufacture and operation of the composite hull.			[SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment			
	[K6_W02] has knowledge in the field of technical mechanics, fluid mechanics, strength of materials, necessary to understand the basic physical phenomena occurring in ocean engineering		The student understands the influence of the technological process on the strength properties of composite hulls.			[SW3] Assessment of knowledge contained in written work and projects			

Subject contents	1. Introduction to traditional and the latest composite materials in yacht and aviation technology (glass, aramid and carbon fiber, spacers, prepreg, infusion)							
	2. Preparation of the 3D model for the execution of the physical model (feasibility on 3 and 5-axis machine tools, surface quality, technological allowances, simulation of CNC machining)							
	3. Execution of a physical model in CNC technology and manually (preparation of material for processing, basing and fixing the material, rough and fine machining, covering the model with a leveling layer, manual final processing of the model)							
	4. Mold making (model preparation, mold lamination, mold stiffening structure, demoulding)							
	5. Production of the hull in technology (from mold preparation to removal of the hull) in contact technology, vacuum bag, infusion, LRTM., RTM, prepreg							
	6. Composite hull postprocessing (manual, water, laser treatment)							
	7. Quality control (3D scanning)							
	8. Material tests (strength, thermal and chemical) of composite samples.							
	9. Organization of work in a yacht shipyard							
	10. Special issues (racing and military units, elements of sails, equipment)							
Prerequisites and co-requisites	Intermediate computer skills, especi	ially in the field of 3D CAD						
Assessment methods	Subject passing criteria	Passing threshold	Percentage of the final grade					
and criteria	Completion of project tasks	50.0%	50.0%					
	Written test	50.0%	50.0%					
Recommended reading	Basic literature	 Lars Larsson, Michał Orych, Rolf E. Eliasson: Podstawy projektowania jachtów Witold Tobis: Budowa i naprawa jachtów z laminatów Tadeusz Sołtyk: Budowanie jachtów FiberSim manual 						
		5. Siemens NX Composites Program Manual						
		6. Ansys Granta EduPack manual						
	Supplementary literature e-larning course on the eNauczanie platform							
	eResources addresses	Adresy na platformie eNauczanie:						

Example issues/ example questions/ tasks being completed	
0	Components of the composite hull manufacturing process:
	- digital model
	- physical model
	- making and demoulding the mould
	- preparation of the mold for production (surface, separating layer)
	- manufacturing of the hull in the selected technology
	Opportunity to pass the course as part of the KSTO KORAB activity
Work placement	Not applicable

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