



## Subject card

Subject name and code	, PG_00056251						
Field of study	Design and Construction of Yachts						
Date of commencement of studies	October 2021	Academic year of realisation of subject			2022/2023		
Education level	first-cycle studies	Subject group			Obligatory subject group in the field of study Subject group related to practical vocational preparation		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	2	Language of instruction			Polish		
Semester of study	3	ECTS credits			2.0		
Learning profile	practical 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	dr inż. Konrad Marszałkowski dr inż. Cezary Żrodowski					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	E-learning hours included: 0.0						
	Prototypowanie w projektowaniu jachtu, L, PiBJ, sem05, zimowy 22/23 - Moodle ID: 26976 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=26976">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=26976</a>						
	Additional information: The lecture can be provided in remote mode in case of necessity						
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	30	4.0		16.0	50	
Subject objectives	To familiarize students with prototyping techniques in the yacht industry, including:a) hull - hand-made model, CNC (model and form)b) equipment (3D printing)c) drive and devices (modular profiles)						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K6_W05	The student presents the entire process of building a prototype for the selected type of yacht and the materials used.			[SW3] Assessment of knowledge contained in written work and projects		
	K6_U06	The student prepares a digital 3D model to make a prototype in CNC technology or 3D printing.			[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools		
	K6_U05	The student independently defines particular technical tasks necessary to complete the given hull or device prototype.			[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject		
Subject contents	Prototyping techniques in the yachting industry, including: 1. creating a digital 3D model of the hull 2. hand-made model of the hull 3. CNC (hull model and / or mold) 4. equipment and machine parts (prototyping and additive manufacturing - FDM, SLS, SLM) 5. equipment and machine parts - working prototypes (modular profiles)						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade		
	Test	50.0%			50.0%		
	Completion of exercises	75.0%			50.0%		

Recommended reading	Basic literature	1. JeanClaude Andre: From Additive Manufacturing to 3D/4D Printing 2. G. Budzik, P. Siemiński: Techniki przyrostowe. Druk 3D. Drukarki 3D ?
	Supplementary literature	User manuals for Siemens NX and nTopology
	eResources addresses	
Example issues/ example questions/ tasks being completed	<p>Exercises:</p> <ol style="list-style-type: none"> <li>1. Prepare a digital model of the hull for CNC machining, based on theoretical lines.</li> <li>2. Prepare a digital model of the selected part for 3D printing, based on the drawing.</li> </ol> <p>Test:</p> <ol style="list-style-type: none"> <li>1. What is the difference between 3- to 5-axis CNC machining?</li> <li>2. Specify the advantages and disadvantages of the FD M technology</li> <li>3. What is the difference between SLM and SLS technology?</li> </ol>	
Work placement	Not applicable	