



Subject card

Subject name and code	, PG_00056293						
Field of study	Ocean Engineering						
Date of commencement of studies	October 2021	Academic year of realisation of subject			2023/2024		
Education level	first-cycle studies	Subject group			Optional subject group 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		
Semester of study	5	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Theory and Ship Design -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Lech Rowiński					
	Teachers	dr hab. inż. Leszek Matuszewski dr hab. inż. Lech Rowiński					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	30.0	0.0	45
	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	45	5.0		25.0	75	
Subject objectives	To provide student with basic knowledge regarding materials and technologies used in manufacturing of the composite structures of boats and ships.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U05] can formulate a simple engineering task and its specification within the range of design, construction and operation of ocean technology objects and systems	The student explains the principles of using components for forming hulls	[SU1] Assessment of task fulfilment
	[K6_W06] has an organized knowledge on engineering methods and design tools allowing the conducting of projects within the construction and operation of ocean technology objects and systems	348 / 5 000 Wyniki tłumaczenia Tłumaczenie Evaluation of the task implementation [K_W15] has extended and deepened knowledge in the field of designing complex technological processes for the construction and repair of ship hulls, yachts and other ocean-technical objects made of various materials and / or technological processes for the construction and renovation of propulsion systems and general ship equipment.	[SW2] Assessment of knowledge contained in presentation
	[K6_W05] has an organized knowledge on design, construction and operation of ocean technology objects and systems	The student knows the relationship between the structure and the technology of its implementation from polymer composites. The student knows the basic methods of calculating structural elements made of composites [SU1]	[SW3] Assessment of knowledge contained in written work and projects
	[K6_U06] in compliance with a formulated specification and with the aid of appropriate tools and methods, is able to complete a simple engineering task within the range of design, construction and operation of ocean technology objects and systems	The student knows the composite materials and technologies for the production of structures necessary to design structures with given performance parameters and resistant to the environment in the assumed period of time.	[SU5] Assessment of ability to present the results of task
Subject contents	The lecture and seminary: the general profile of non-metallic materials and their application in ocean technology. The property of materials mechanical, chemical, thermal, flammability, etc. Duraplastics and the example of the phenol resins, their activation and hardening, defects and advantage. Composites, basic resins polyester and epoxy fibers strengthening -constructions in ocean technology. The technology of laminating hand contact, vacuum methods, technological gear. Glues and protective and decorative coatings, varnishes, colors. The seminary add: Materials in advanced composites and materials the technological Preparation of technological tools, contact forming, vacuums, method of the injection, etc		
Prerequisites and co-requisites	Requirements concern the basic knowledge of materials strength and fatigue questions, and different criteria of the materials properties, e.g. corrosion resistance, aging, and particular chemical relationships.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Essay	60.0%	80.0%
	Midterm colloquium	60.0%	20.0%
Recommended reading	Basic literature	1. Berger M. i inni: „Poliestry wzmocnione w budownictwie okrętowym”, Wydawnictwo Morskie, Gdynia, 1961.2. Kozłowski J., Wilczopolski M., Wituszyński K.: „Konstrukcje okrętowe z kompozytów polimerowych”; Wydawnictwo Morskie, Gdańsk, 1982.3. Przepisy klasyfikacji i budowy jachtów morskich (JAC), Część II, Kadłub – 1996/19984. Przepisy klasyfikacji i budowy łodzi motorowych (MOT), Część II, Kadłub – 1996/1998	
	Supplementary literature	1. Dobrosz K.,Matysiak A.,Tworzywa sztuczne Warszawa WSZiP 19852. Kłosowska-Wałkiewicz Z.,Królikowski W.,Penczek P..Żywice i laminaty poliestrowe. Warszawa WNT 19803. Kozłowski J.,Wilczopolski M..Materiałoznawstwo okrętowe czIII Okrętowe Tworzywa Polimerowe. Gdynia WSMW 19824. Królikowski W., Tworzywa wzmocnione i włókna wzmocniające.Warszawa WNT 19885. Spychaj T. Spychaj D.,Farby i kleje wodorozcieńczalne Warszawa WNT 19966. Żuchowska D.,Polimery konstrukcyjne. Warszawa WNT 1995	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		