



Subject card

Subject name and code	Marine Energy Technologies, PG_00062667						
Field of study	Naval Architecture and Offshore Structures						
Date of commencement of studies	February 2024		Academic year of realisation of subject		2023/2024		
Education level	second-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	1		Language of instruction		Polish		
Semester of study	1		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Division of Marine Power Plants -> Institute of Naval Architecture -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. inż. Zbigniew Korczewski				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	0.0	0.0	30
	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	30		7.0		13.0	50
Subject objectives	Teach the basics of marine energy in terms of the possibility of using renewable energy sources, with particular emphasis on the applied energy system solutions.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_W01] Identifies with a profound understanding the phenomena related to ocean engineering, describing advanced theories and methods for analyzing processes in technical oceanographic systems		Has basic knowledge of energy transformation and transmission processes carried out in complex ocean engineering systems.		[SW1] Assessment of factual knowledge		
	[K7_K02] Is aware of their social role as a graduate of a technical institution, understanding the importance of adhering to professional ethics and respecting diverse perspectives		Is aware of the need to develop new marine technologies in the field of renewable energy sources.		[SK4] Assessment of communication skills, including language correctness		
	[K7_W05] Considers in advanced analyses the technical, environmental, economic, legal, and ethical aspects related to maritime activities, demonstrating an awareness of responsibility for decisions made and fostering the development of individual entrepreneurship		Has basic knowledge in the range of technical possibilities within the application of renewable energy sources in marine energy systems.		[SW1] Assessment of factual knowledge		

Subject contents	1. Basic sources and types of energy - renewable and non-renewable energy resources 2. The concept of energy consumption and energy expenditure. 3. Wind energy - offshore wind farms, sail propulsion 4. Energy of sea and ocean waters - hydroelectric power plants 5. Solar energy - solar collectors and photovoltaic cells 6. Energy storage 7. Hydrogen as an energy carrier 8. Electrolysers and fuel cells 9. Selected solutions of energy systems in the field of renewable energy		
Prerequisites and co-requisites	Knowledge in thermodynamics, fluid mechanics and machine construction.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	two colloquia	51.0%	100.0%
Recommended reading	Basic literature	Chmielniak T.: Technologie energetyczne. Wydawnictwo Naukowe PWN SA, Warszawa 2021. Gronowicz J.: Niekonwencjonalne źródła energii. Biblioteka Problemów Eksploatacji, Radom-Poznań 2008. <i>Lewandowski W. M.: Proekologiczne odnawialne źródła energii odnawialnej. WNT Warszawa 2006</i> Tytko R.: Urządzenia i systemy energetyki odnawialnej. Wydawnictwo Eco Investment, Kraków 2021. Energia 2020, GUS Warszawa 2020. Ziębik A.: Systemy energetyczne. Politechnika Śląska, Gliwice 1991.	
	Supplementary literature	Culp A.W. : Principles of energy conversion. 2 nd edition. McGraw-Hill Inc. New York 1991. Wu B., Youngqiang L., Navid Z., Samir K.: Power Conversion and Control of Wind Energy, John Wiley & Sons, INC., Publication, 2011.	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	Characterize renewable energy sources in terms of the performance and efficiency of the energy conversion process.		
Work placement	Not applicable		

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