



## Subject card

Subject name and code	Offshore power engineering, PG_00065616						
Field of study	Naval Architecture and Offshore Structures						
Date of commencement of studies	February 2025		Academic year of realisation of subject		2024/2025		
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		English		
Semester of study	1		ECTS credits		3.0		
Learning profile	general academic 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		prof. dr hab. inż. Zbigniew Korczewski				
	Teachers		prof. dr hab. inż. Zbigniew Korczewski				
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		8.0		37.0	75
Subject objectives	To teach the basics of offshore power engineering in terms of the possibilities of using renewable energy sources, with particular emphasis on the solutions applied in offshore energy systems.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_K82] is equipped to participate actively in lectures, seminars and laboratory classes conducted in foreign language		Is prepared to independently study specialist English-language literature in the field of offshore power power engineering..		[SK4] Assessment of communication skills, including language correctness		
	[K7_U13] evaluates the feasibility and potential for utilizing new technical and technological achievements in accomplishing tasks characteristic for the field of study		Analyses and synthesizes new design solutions for offshore power systems based on renewable energy sources.		[SU2] Assessment of ability to analyse information		
	[K7_K13] is ready for responsible performance of professional roles, considering ever-changing need of the society, including self developement and supporting and fulfilling work ethics		Is aware of the need to develop new offshore power technologies in the field of renewable energy sources.		[SK4] Assessment of communication skills, including language correctness		
	[K7_W13] explains the main principles of individual and teamwork organization, including various forms of entrepreneurship utilizing knowledge from the field of engineering and technical sciences and disciplines relevant to the course of study		Has basic knowledge of energy transformation and transmission processes carried out in complex offshore power engineering systems.		[SW1] Assessment of factual knowledge		

Subject contents	<div>1. Basic sources and types of energy renewable and non-renewable energy resources</div> <div>2. The notion of energy consumption and energy outlays (costs)</div> <div>3. Wind energy - offshore wind power plants, sail drive</div> <div>4. Energy from sea and ocean waters hydroelectric power plants</div> <div>5. Solar energy - solar collectors and photovoltaic cells</div> <div>6. Energy storage - gravity and compressed air systems</div> <div>7. Hydrogen as an energy carrier</div> <div>8. Electrolyzers and fuel cells</div> <div>9. Selected solutions for energy systems in the field of renewable energy sources</div>		
Prerequisites and co-requisites	Knowledge of thermodynamics, fluid mechanics and mechanical engineering.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	two tests	51.0%	100.0%
Recommended reading	Basic literature	<div>1. Culp A.W. : Principles of energy conversion. 2<sup>nd</sup> edition. McGraw-Hill Inc. New York 1991.</div> <div>2. Wu B., Youngqiang L., Navid Z., Samir K.: Power Conversion and Control of Wind Energy, John Wiley &amp; Sons, INC., Publication, 2011.</div> <div>3. Gronowicz J.: Unconventional energy sources. Library of Exploitation Problems, Radom-Poznań 2008 (in Polish).</div>	
	Supplementary literature	<div>1. Chmielniak T.: Technologie energetyczne. Wydawnictwo Naukowe PWN SA, Warszawa 2021.</div> <div>2. Gronowicz J.: Niekonwencjonalne źródła energii. Biblioteka Problemów Eksploatacji, Radom-Poznań 2008.</div> <div>3. <i>Lewandowski W. M.: Proekologiczne odnawialne źródła energii odnawialnej. WNT Warszawa 2006</i></div> <div>4. Tytko R.: Urządzenia i systemy energetyki odnawialnej. Wydawnictwo Eco Investment, Kraków 2021.</div> <div>5. Ziębik A.: Systemy energetyczne. Politechnika Śląska, Gliwice 1991.</div>	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	<div>1. Explain the notion of a cumulative energy consumption.</div> <div>2. What does a wind power depend on - calculation formula.</div> <div>3. Characterize the usage model of a wind power plant.</div>		
Work placement	Not applicable		

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