GDAŃSK UNIVERSITY OF TECHNOLOGY

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 offfshore power systems based on renewable energy sources.	[SU2] Assessment of ability to analyse information
[K7_K13] is ready for responsible performance of proffesional roles, considering ever-changing need of the society, including self developement and supporting and fullfiling 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	1. Basic sources and types of energy renewable and non-renewable energy resources 2. The notion of energy consumption and energy outlays (costs) 3. Wind energy - offshore wind power plants, sail drive 4. Energy from sea and ocean waters hydroelectric power plants 5. Solar energy - solar collectors and photovoltaic cells 6. Energy storage - gravity and compressed air systems 7. Hydrogen as an energy carrier 8. Electrolyzers and fuel cells 9. Selected solutions for energy systems in the field of renewable energy sources
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	1. Culp A.W. : Principles of energy conversion. 2nd edition. McGraw-Hill Inc. New York 1991. 2. Wu B., Youngqiang L., Navid Z., Samir K.: Power Conversion and Control of Wind Energy, John Wiley & Sons, INC., Publication, 2011. 3. Gronowicz J.: Unconventional energy sources. Library of Exploitation Problems, Radom-Poznań 2008 (in Polish).
Supplementary literature	1. Chmielniak T.: Technologie energetyczne. Wydawnictwo Naukowe PWN SA, Warszawa 2021. 2. Gronowicz J.: Niekonwencjonalne źródła energii. Biblioteka Problemów Eksploatacji, Radom-Poznań 2008. 3. *Lewandowski W. M.: Proekologiczne odnawialne źródła energii odnawialnej. WNT Warszawa 2006* 4. Tytko R.: Urządzenia i systemy energetyki odnawialnej. Wydawnictwo Eco Investment, Kraków 2021. 5. Ziębik A.: Systemy energetyczne. Politechnika Śląska, Gliwice 1991.
eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed

1. Explain the notion of a cumulative energy consumption.

2. What does a wind power depend on - calculation formula.

3. Characterize the usage model of a wind power plant.

Work placement	Not applicable

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