GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00057172		
Field of study	Ocean Engineering		
Date of commencement of studies	February 2022	Academic year of realisation of subject	2022/2023
Education level	second-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	1	Language of instruction	Polish
Semester of study	2	ECTS credits	4.0
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. Piotr Doerffer	
	Teachers	prof. dr hab. inż. Piotr Doerffer dr inż. Joanna Grzelak	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	30.0	0.0	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	10.0	45.0	100

Subject objectives

Aerodynamic aspects connected to wind turbines in general and especially with implementation in marine environment.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W03] has a widened knowledge in the range of reliability and safety of ocean technology objects and systems and environmental protection in ocean technology	The student is able to assess the safety of wind turbines and their impact on the environment	[SW3] Assessment of knowledge contained in written work and projects
[K7_U04] can apply mathematical methods and models and computer simulations to analyse, design, and assess the functioning of ocean technology objects and systems and their elements	Uses mathematical methods and models to evaluate the performance of wind turbines and their components	[SU2] Assessment of ability to analyse information [SU5] Assessment of ability to present the results of task
[K7_W06] has an organized, widened knowledge on engineering methods and design tools allowing the conducting of advanced projects within the construction and operation of ocean technology objects and systems	knowledgable in methods and tools for application in building and exploitation of wind turbines at sea.	[SW1] Assessment of factual knowledge
[K7_W05] has an organized, widened knowledge on design, construction and operation of ocean technology objects and systems	Can demonstrate knowledge in the design, construction and operation of wind turbines	[SW1] Assessment of factual knowledge
[K7_U06] when forming and solving design tasks can see their non-technical aspects, including environmental, economical and legal ones. Applies HSE rules and regulations	is able to connect construction aspects with environmental implications of the instalation and explatation of wind turbunes at sea	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools

Subject contents

applied aerodynamics, types of flows, aerodynamic characteristics of profiles, formation of blades for horizontal axis wind turbines, aerodynamic analysis of vertical axis wind turbines

Prerequisites and co-requisites	basic knowledge of fluid mechanics	
Assessment methods and criteria	Subject passing criteria: assessment test; Passing threshold: 50.0%; Percentage of the final grade: 100.0%	
Recommended reading	Basic literature	Offshore Wind: Technologies, Ecological Risks & Prospects, Chester Mendoza, ISBN-13 : 978-1634823647 Wind Energy Handbook, Nick Jenkins, Tony L Burton, Ervin Bossanyi, David Sharpe, Michael Graham; ISBN-13 : 978-1119451099 Wind Energy Engineering: A Handbook for Onshore and Offshore Wind Turbines, Trevor M. Letcher; ISBN-13 : 978-0128094518 Offshore Wind Power; John Twidell and Gaetano Gaudiosi; ISBN: 9780906522639
	Supplementary literature	https://drg.pomorskie.eu/wp-content/uploads/2021/07/WIZJA-DLA-BALTYKU.-WIZJA-DLA-POLSKI.-ROZWOJ-MORSKIEJ-ENERGETYKI-WIATROWEJ.pdf https://pism.pl/publikacje/Rozwoj_morskiej_energetyki_wiatrowej_na_Morzu_Baltyckim
	eResources addresses	
Example issues/ example questions/ tasks being completed	**Calculation of Power coefficient for given wind turbine** **Explain what is TSR (tip speed ratio)** **Explain operation of Savonius rotor** **Explain operation of Darrieus rotor** **Why HAWT must be stopped to wind speed of above 22 m/s**	
Work placement	Not applicable	