



Subject card

Subject name and code	Operational Management and Maintenance of Wind Energy Systems , PG_00066987						
Field of study	Smart Renewable Energy Engineering						
Date of commencement of studies	October 2026	Academic year of realisation of subject				2027/2028	
Education level	second-cycle studies	Subject group				Specialty 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	2	Language of instruction				English	
Semester of study	3	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 -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Zbigniew Korczewski					
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	15.0	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		4.0		16.0	50
Subject objectives	To teach the principles of operating wind turbines, with particular emphasis on their diagnosis and maintenance.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K7_U04] possesses remote diagnostic skills and the ability to address technical issues in energy systems using remote diagnostic tools	Student is able to identify the wear process of structural elements of a wind turbine based on the results of a diagnostic test.			[SU1] Assessment of task fulfilment		
	[K7_W05] understands the principles of sustainable development and safety in the context of energy systems, including the role of electrification, and can assess the environmental impact of renewable energy systems, particularly wind power installations	Student possesses knowledge in the field of operation for the practical usage and supervision of wind farm machines and energy equipment in various operating states.			[SW2] Assessment of knowledge contained in presentation		
	[K7_W06] is acquainted with global, European, and national energy policies and regulations regarding renewable energy and has basic knowledge of project management in the context of energy engineering	A student has knowledge in the range of wind farm operating strategies and costs.			[SW1] Assessment of factual knowledge		
	[K7_K05] complies with legal regulations and standards related to renewable energy, including wind power, ensuring that energy installations and projects operate in accordance with current legislation	Student is able to classify the operational states of a wind farm.			[SK2] Assessment of progress of work		

Subject contents	<p>Course content – lecture Lecture: <i>Sciences about the operation of technical objects and systems - a place of technical diagnostics.</i></p> <p><i>Physical ageing and wear of machines and devices of wind energy systems.</i></p> <p><i>Characteristic technical states of wind power plants - the notion of failure/fault and damage, examples of operational damages to wind power plants.</i></p> <p><i>Operational states of wind power plants - usage and maintenance.</i></p> <p><i>Strategies and management of the wind farm operation process - analysis of operating costs.</i></p> <p>Seminar: <i>The role of diagnostic systems in planning the strategy of wind farm operation.</i></p>		
Prerequisites and co-requisites	<p><i>Knowledge in the field of the construction and principles of operation of energy machines and devices.</i></p>		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Lecture - colloquium	51.0%	75.0%
	Seminar - report/speech	100.0%	25.0%
Recommended reading	<p>Basic literature</p> <p>Supplementary literature</p> <p>eResources addresses</p>	<p><i>Czichos H.: Handbook of Technical Diagnostics: Fundamentals and Application to Structures and Systems. Springer Science & Business Media. 2013.</i></p> <p><i>Letcher T. M. Wind Energy Engineering. A Handbook for Onshore and Offshore Wind Turbines. Academic Press. Elsevier Inc. 2017.</i></p> <p><i>Ramsey D.: The different types of industrial wear and tear. UK, 2016.</i></p> <p><i>ISO 13372:2012 : Condition monitoring and diagnostics of machines Vocabulary.</i></p> <p>Scientific articles on wind turbine operation and diagnostics.</p>	
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> 1. Explain the notion of damage to a technical object. 2. Characterize the strategies for operating wind turbines in terms of costs. 3. Describe the models of wear of rolling and sliding friction nodes. 		
Practical activities within the subject	<p>Not applicable</p>		

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