

。 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Wind turbine control, PG_00065536								
Field of study	Naval Architecture and Offshore Structures								
Date of commencement of studies	February 2026		Academic year of realisation of subject			2026/2027			
Education level	second-cycle studies		Subject group		Specialty subject group Subject group related to scientific research in the field of study				
Mode of study	Part-time studies		Mode of delivery			at the university			
Year of study	1		Language of instruction			English			
Semester of study	2		ECTS credits			3.0			
Learning profile	general academic profile		Assessment form			assessment			
Conducting unit	Division of Automatio Engineering and Ship	n and Marine E Technology ->	Energy -> Institute of Naval Architecture -> Faculty of Mechanical > Wydziały Politechniki Gdańskiej						
Name and surname	Subject supervisor		dr inż. Mohammad Ghaemi						
of lecturer (lecturers)	Teachers								
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
of instruction	Number of study hours	9.0	0.0	9.0	0.0		0.0	18	
	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	18		7.0		50.0		75	
Subject objectives	Learning the basic concepts of wind turbine control systems, the method of modeling, analysis and synthesis of these systems in conjunction with operational aspects, and acquiring the ability to applycontrol systems in industrial practice in the field of offshore energy systems with an emphasis on wind farms.								
Learning outcomes	Course outcome Subject outco					Method of verification			
	[K7_U04] creatively designs or modifies, either entirely or in part, a shipborne or offshore system or process according to a given specification, considering both technical and non-technical aspects, estimating costs and adopting design techniques representative for the field		Creatively designs or modifies, in whole or in part, wind turbine control systems according to given technical specifications and operational requirements, considering both technical and non-technical aspects.			[SU3] Assessment of ability to use knowledge gained from the subject			
	[K7_K81] is able to cooperate in international team at her/his own university, during work placement and during study abroad		Can effectively cooperate with an international team conducting projects related to the analysis, design, and implementation of wind turbine control systems.			[SK1] Assessment of group work skills			
	[K7_K82] is equipped to participate actively in lectures, seminars and laboratory classes conducted in foreign language		Knows specialized terminology enabling active participation in lectures and laboratory classes on wind turbine control systems.			[SK4] Assessment of communication skills, including language correctness			
Subject contents	 Introduction, goal, nomenclature, definitions, basic concepts and types of control systems Modeling a wind turbine as an object of a control system, including mechanical, aerodynamic and electrical subsystems Modeling of wind influence as an input variable of the control system Influence of wind turbine operational aspects including energy conversion, mechanical load, power quality and operating modes, on the analysis and synthesis of control system Wind turbine control strategies and methods, including yaw control, active pitch regulation, load control, stall control, aileron control, and generator slip control Analysis and synthesis of selected control systems of wind turbines 								
Prerequisites and co-requisites	Basic information on automation and control systems at B.Sc. level in the Ocean Eng. field								

Assessment methods	Subject passing criteria	Passing threshold	Percentage of the final grade		
and criteria	Lab. report	50.0%	48.0%		
	Attendance	0.0%	4.0%		
	Test/colloquium	50.0%	48.0%		
Recommended reading	Basic literature	 Lubośny Z., Farmy wiatrowe w systemie elektroenergetycznym, Wydawnictwo Naukowe PWN, Warszawa, 2016. Bianchi F. D., De Battista H., Mantz R. J., Wind turbine control systems - principles, modelling and gain scheduling design, ISBN-10: 1-84628-492-9, Springer-Verlag London Limited, 			
	Supplementary literature	 Precup R. E., Kamal T., SHassan S. Z., Advanced Control and Optimization Paradigms for Wind Energy Systems, ISBN 978-981-13-5994-1, Springer Nature Singapore Pte Ltd., 2019 			
	eResources addresses				
Example issues/ example questions/ tasks being completed	Please visit the following page: https://enauczanie.pg.edu.pl/moodle/course/view.php?id=32781				
Work placement	Not applicable				

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