



## Subject card

Subject name and code	, PG_00057172						
Field of study	Ocean Engineering						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2023/2024		
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	dr hab. inż. Paweł Flaszynski					
	Teachers	dr inż. Joanna Grzelak dr hab. inż. Paweł Flaszynski					
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	Rehersal of theoretical Fluid Mechanics  Aerodynamics of aerofoils  Analysis of blade aerodynamics of horisontal axis wind turbines  Analisis of blade operation of Darrieus type vertical rotor  Analisis of Savonius vertical rotor  Maintenance topics at off-shore wind turbines						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_W05] has an organized, widened knowledge on design, construction and operation of ocean technology objects and systems	basic knowledge in off-shore wind turbines farms	[SW1] Assessment of factual knowledge
	[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	knowledge on exploitation conditions of off-shore wind turbines	[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	Knowledge on wind turbine aerodynamics	[SW1] Assessment of factual knowledge
	[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	knowledge on environmental effects of off-shore 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	awareness on safety issues in off-shore wind turbines implementation	[SU2] Assessment of ability to analyse information	
Subject contents	<p>Knowledge on aerodynamics of different types of wind turbines</p> <p>Exploitation topics of off-shore wind turbines</p>		
Prerequisites and co-requisites	Introductory basic knowledge on fluid mechanics		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	written test	50.0%	100.0%
Recommended reading	Basic literature	<p>1) Krystyna Jeżowiecka-Kabsch, Henryk Szewczyk; Fluid Mechanics; Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2001; ISBN 83-7085-597-0</p> <p>2) Włodzimierz Prosnak, Fluid Mechanics; Wydawnictwo Naukowe PWN</p> <p>3) Romuald Puzyrewski, Jerzy Sawicki; Basis of Fluid Mechanics; PWN; ISBN: 978-83-011-7327-2</p> <p>4) Bernhard Stoevesandt, Gerard Schepers, Peter Fuglsang, Sun Yuping; Handbook of Wind Energy Aerodynamics; 2022; ISBN-10 3030313069</p>	
	Supplementary literature	1) Hansen Martin; Aerodynamics of Wind Turbines; ISBN 9781138775077; 2015	
	eResources addresses	<p>Adresy na platformie eNauczanie:</p> <p>Aerodynamika turbin wiatrowych, L, Projektowanie i budowa morskich systemów energetycznych (WIMiO), II st. stacj., sem. 2, 23/24 - zima (PG-00057172) - Moodle ID: 33339  <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=33339">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=33339</a></p>	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		