GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00057177		
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 polish
Semester of study	2	ECTS credits	5.0
Learning profile	general academic profile	Assessment form	exam
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 Dymarski	
	Teachers	dr inż. Ewelina Ciba dr hab. inż. Paweł Flaszyński	

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	15.0	30.0	0.0	0.0	75
	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	75	15.0	35.0	125

Subject objectives	Expand the knowledge of fluid mechanics from the bachelor degree. The class covers an expanded scope on the boundary layer, turbulent flow, flow control, aerodynamic wake as well as wind farm scale problems. Basic information on wind turbine aeroacoustics. Laboratory classes on the application of computational fluid dynamics methods.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[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	Student is able to apply theoretical models to analyze aero/ hydrodynamic forces on wind turbines	[SU1] Assessment of task fulfilment
[K7_W05] has an organized, widened knowledge on design, construction and operation of ocean technology objects and systems	Student is able to use theoretical models in a design, construction and operation of wind turbine components	[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	Student is able to use theoretical models to analyze aero- and hydrodynamic loads on wind turbine	[SW1] Assessment of factual knowledge
[K7_U07] in compliance with a formulated specification and with the aid of appropriate tools and methods, is able to complete an advanced engineering task within the range of design, construction and operation of ocean technology objects and systems	Student can characterize the analyzed flow and propose a method for solving the flow problem	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject
[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	Student is able to propose a computational method in the design process	[SW1] Assessment of factual knowledge

Subject contents

Potential flow, flow around cylinder and airfoil, turbulence, boundary layer, laminar-turbulent transition, flow control, aerodynamic wake, fundamentals of atmospheric boundary layer and aerodynamic wake on a wind farm. Basic information on wind turbine aeroacoustics.

Prerequisites and co-requisites

Fundamental knowledge on fluid mechanics (bachelor level)

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
	60.0%	35.0%
	60.0%	35.0%
	60.0%	30.0%

Recommended reading

Basic literature	"Fluid mechanics", Frank White
Supplementary literature	"Turbulence in Fluids", Marcel Lesieur "Numerical Computation of Internal & External Flows", Charles Hirsch
eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed

Work placement

Not applicable