



Subject card

Subject name and code	Numerical Fluid Mechanics - CFD for engineers, PG_00056270						
Field of study	Design and Construction of Yachts						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2024/2025		
Education level	first-cycle studies	Subject group					
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	3	Language of instruction			Polish		
Semester of study	6	ECTS credits			3.0		
Learning profile	practical 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 inż. Michał Krężelewski				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	30.0	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		5.0		25.0	75
Subject objectives	learning methods for the integration of partial differential equations and their application to the self-selected examples						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K6_K03	The student recognizes basic CFD problems. He uses the methods of numerical fluid mechanics and applies them in practice.			[SK5] Assessment of ability to solve problems that arise in practice		
	K6_U05	The student recognizes basic CFD problems. He uses the methods of numerical fluid mechanics and applies them in practice.			[SU5] Assessment of ability to present the results of task		
	K6_W06	The student recognizes basic CFD problems. He uses the methods of numerical fluid mechanics and applies them in practice.			[SW3] Assessment of knowledge contained in written work and projects		
	K6_W05	The student recognizes basic CFD problems. He uses the methods of numerical fluid mechanics and applies them in practice.			[SW3] Assessment of knowledge contained in written work and projects		
Subject contents	Lecture: Overview of numerical fluid mechanics (CFD). Equations governing fluid flow and boundary conditions. Turbulence and its modeling. Methods for solving the discretized governing equations in fluid mechanics. Computational methods considering flows with free surface. Computational methods for potential flows. Project: Modeling of simple flows with RANSE-CFD and comparison of results with theory. Lift and drag force on the wing, flow through a venturi tube. Study of the influence of the size of the computational domain, mesh density and boundary conditions on the obtained results. .						
Prerequisites and co-requisites	Yacht hydromechanics						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Lecture	60.0%	50.0%
	Project	100.0%	50.0%
Recommended reading	Basic literature	Tesch K. Numeryczna mechanika płynów, Wydawnictwo Politechniki Gdańskiej, Gdańsk 2021. Versteeg H. K., Malalasekera W., An introduction to Computational Fluid Dynamic, Longman 1995-98. Gryboś R.: Podstawy mechaniki płynów, t.1,2, PWN W-a 1998r.	
	Supplementary literature	Krężelewski M. Hydromechanika ogólna i okrętowa, tom II, Skrypt Politechniki Gdańskiej, Gdańsk 1982	
	eResources addresses	Adresy na platformie eNauczenie:	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		