



## Subject card

Subject name and code	Modelling and simulation in technology, PG_00057161						
Field of study	Ocean Engineering						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2022/2023		
Education level	second-cycle studies	Subject group			Obligatory subject group in the field of study 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	1	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Faculty of Ocean Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Jerzy Kowalski					
	Teachers	mgr inż. Dominik Kreft dr hab. inż. Jerzy Kowalski					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	15.0	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		20.0	75	
Subject objectives	Acquiring general knowledge in the field of modeling and computer simulations used in ocean engineering						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K7_W04	can apply the appropriate programming tool for the simulation and/or optimization task in the field of ocean engineering			[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	can choose the appropriate method of modeling and optimization to the task in the field of ocean engineering			[SU4] Assessment of ability to use methods and tools		
	[K7_W01] has a deepened and widened knowledge on certain fields of maths, used to formulate, solve and verify complex problems in ocean-technology	is able to distinguish and analyze the methods of modeling and optimization used in ocean engineering			[SW1] Assessment of factual knowledge		
[K7_W02] has a widened knowledge in the range of modelling technological processes, including knowledge necessary to describe and assess the functioning of selected elements of ocean technology objects and systems	presents methods of modeling phenomena in selected elements, objects and ocean engineering systems			[SW1] Assessment of factual knowledge			

Subject contents	<ul style="list-style-type: none"> <li>• Ocean technology - basic issues and areas of activity,</li> <li>• Modeling - classification, model construction and their complexity, adequacy of models and their validation, simulation of phenomena, analysis of modeling results,</li> <li>• Simulation - research on models, initial conditions, boundary conditions,</li> <li>• Optimization - Optimization and polyoptimization problems, data sets and functions, objective functions, classification, optimization methods,</li> <li>• Modeling in ocean technology - modeling in ship design, modeling in power engineering, modeling in environmental protection.</li> </ul>											
Prerequisites and co-requisites	overall knowledge in the field of ocean engineering											
Assessment methods and criteria	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Subject passing criteria</th> <th style="width: 33%;">Passing threshold</th> <th style="width: 33%;">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td>60.0%</td> <td></td> <td>50.0%</td> </tr> <tr> <td>60.0%</td> <td></td> <td>50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	60.0%		50.0%	60.0%		50.0%
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Recommended reading	Basic literature	Springer handbook of ocean engineering Manhar R. Dhanak, Nikolaos I. Xiros Springer, 2016.										
	Supplementary literature	•Ship-shaped offshore installations : design, building, and operation / Jeom Kee Paik, Anil Kumar Thayamballi, Cambridge, 2011.										
	eResources addresses	Adresy na platformie eNauczenie: Modelowanie i symulacja w technice, W, Oce, II st., sem 1, lato 2022/23 - Moodle ID: 29557 <a href="https://enauczenie.pg.edu.pl/moodle/course/view.php?id=29557">https://enauczenie.pg.edu.pl/moodle/course/view.php?id=29557</a> Modelowanie i symulacja w technice, W, Oce, II st., sem 1, lato 2022/23 - Moodle ID: 29557 <a href="https://enauczenie.pg.edu.pl/moodle/course/view.php?id=29557">https://enauczenie.pg.edu.pl/moodle/course/view.php?id=29557</a>										
Example issues/ example questions/ tasks being completed												
Work placement	Not applicable											