



## Subject card

Subject name and code	Fundamentals of Ship Automation, PG_00046538						
Field of study	Ocean Engineering, Ocean Engineering						
Date of commencement of studies	October 2020		Academic year of realisation of subject		2023/2024		
Education level	first-cycle studies		Subject group				
Mode of study	Part-time studies		Mode of delivery		at the university		
Year of study	4		Language of instruction		Polish		
Semester of study	7		ECTS credits		2.0		
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 inż. Mohammad Ghaemi				
	Teachers		dr inż. Mohammad Ghaemi				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	20.0	0.0	0.0	0.0	0.0	20
	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	20		3.0		27.0	50
Subject objectives	The main aim of the subject is education of students in the range of 3 fundamentals of marine control systems: course and trajectory control, ship propulsion system control and roll stabilisation systems.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W05] has an organized knowledge on design, construction and operation of ocean technology objects and systems		The student has structured knowledge of the design of ship control systems		[SW1] Assessment of factual knowledge		
	[K6_W08] has knowledge of the principles of sustainable development		The student has knowledge of the principles of sustainable development in the field of ship automation; including basic knowledge in the field of analyzing and designing automation systems used in ship technology for guidance and control of ocean engineering facilities, taking into account motion stability, propulsion, marine and maneuvering features.		[SW1] Assessment of factual knowledge		
	[K6_W06] has an organized knowledge on engineering methods and design tools allowing the conducting of projects within the construction and operation of ocean technology objects and systems		The student has a structured knowledge of engineering design methods enabling the implementation of conceptual designs in the field of major ship control systems, including the course and trajectory control system, the propulsion control system, and the ship's roll stabilization system.		[SW1] Assessment of factual knowledge		
	[K6_U05] can formulate a simple engineering task and its specification within the range of design, construction and operation of ocean technology objects and systems		The student can formulate a simple engineering task and its specification in the field of modeling, design, and operation of ship control systems		[SU3] Assessment of ability to use knowledge gained from the subject		

Subject contents	1. The concept and introduction and principle definitions 2. Mathematical model of ship motion 3. Environmental disturbances: wind, wave and current 4. Ship manoeuvrability 5. Ship course control 6. Ship trajectory control 7. Ship roll control 8. Ship speed control 9. Ship motion model identification		
Prerequisites and co-requisites	Preceding subjects: 1. Fundamentals of ocean engineering 2. Mechanics I 3. Fundamentals of ship power plants, 2. Fundamentals of automatics.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	1 colloquium, 100 points, duration: 1 hour	56.0%	96.0%
	Presence and activity: 5 points	0.0%	4.0%
Recommended reading	Basic literature	<b>Basic literature</b>  1. 2. Fossen T. I., Handbook of Marine Craft Hydrodynamics and Motion Control, John Wiley & Sons, 2011.  2. Thor I. Fosen: Marine Control Systems, Marine Cybernetics AS, 2002.	
	Supplementary literature	1. Thor I. Fossen: Guidance and Control of Ocean Vehicles. John Wiley and Sons, 1994.	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	-		
Work placement	Not applicable		