



## Subject card

Subject name and code	Guidance navigation and controls of ships, PG_00057234						
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		5.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Zakład Projektowania Okrętu -> Institute of Ocean Engineering and Ship Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Maciej Reichel				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	30.0	15.0	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		10.0		40.0	125
Subject objectives	To familiarize the students with the knowledge regarding to: a scope of ship control systems; devices supporting of ships steering; cooperation between propellers, rudders and thrusters; an identification methods of navigational environmental parameters; a concept of dynamic positioning for offshore mobile units						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[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 becomes familiar with a structure of control systems applied in ship's dynamic positioning, working principles of dynamic positioning components, and operational modes of DP system work		[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		Student recognizes and knows the ship control systems and physical processes connected with the ship movement. He is able to identify the parameters of navigational environmental and arrange the ship movement trajectory		[SU2] Assessment of ability to analyse information		
	[K7_W05] has an organized, widened knowledge on design, construction and operation of ocean technology objects and systems		Student apply known working principles of dynamic positioning components and regimes of its work to carry out series of laboratory exercises connected with position keeping of the floating offshore unit		[SW1] Assessment of factual knowledge		

Subject contents	Fundamentals of navigation (speed and course of the vessel; coastal navigation; practical astronavigation; radio navigation		
	Positioning of floating-introduction		
	Dynamic positioning system of ships		
	Satellite navigation systems		
	Reference systems dynamic positioning		
	Cooperation steering gear, main drive thrusters, rudders and the other thrusters with a floating		
	Side effects of the propeller		
	Interoperability of the rudder and screws		
	Interoperability of the rudder, propeller and rudder		
	Design solutions drive contemporary craft		
	Drive systems and electro-hydraulic control of contemporary craft		
	Disruption acting on the vessel and from the wind, wave and sea current		
	The method of calculation (determination) of thrust forces from the wind, wave and current sea craft		
	Maintaining the position of the item and specifying the size and direction of the interacting forces:		
	<div>- system movements of their own unit</div> <div>- sensors control orientation (of the course)</div> <div>- size and direction of thrust force measurement system</div> <div>- control system</div>		
	Dynamic positioning task		
	Requirements and classes of dynamic positioning systems		
Operating modes of dynamic positioning vessels			
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	workout	60.0%	25.0%
	laboratory	60.0%	25.0%
	lectures – test	60.0%	50.0%

Recommended reading	Basic literature	Introduction to Dynamic Positioning (2010). International Marine Contractors Association.  Bray D., Dynamic positioning, Oilfield Publications, 2003.
	Supplementary literature	Tarelko W. Power Take-off Systems of Offshore Rig Power Plants. Journal of Polish CIMAC. Vol. 5 No 1. 2010. pp. 187-198
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	