



Subject card

Subject name and code	Navigation Systems, PG_00048381						
Field of study	Electronics and Telecommunications						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2022/2023		
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	1	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Marine Electronic Systems -> Faculty of Electronics, Telecommunications and Informatics						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Jacek Marszal					
	Teachers	dr hab. inż. Jacek Marszal					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	0.0	0.0	30
	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	30		4.0		16.0	50
Subject objectives	Overview of topics characterizing the principles of operation and structure of marine navigation, communications, radar and sonar systems, which are electronic equipment of vessels, divided into mandatory systems - due to the IMO conventions relating to the safety at sea, and utility ones - used in offshore activity						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_W03] Knows and understands, to an increased extent, the construction and operating principles of components and systems related to the field of study, including theories, methods and complex relationships between them and selected specific issues - appropriate for the curriculum.	Student defines tasks and basic concepts of navigation. He discusses mapping methods and maps. He classifies and describes the classical methods of navigation and technical methods for their implementation. He presents the work principles and performance of navigation devices. He explains principles of work and gives the parameters of satellite navigation system GPS. He discusses principles of functioning of hydroacoustic navigation systems and their applications. He describes the operation of ILS in aviation navigation.	[SW3] Assessment of knowledge contained in written work and projects
	[K7_W06] Knows and understands, to an increased extent, the basic processes taking place in the life cycle of devices, facilities and technical systems.	Student defines tasks and basic concepts of navigation. He discusses mapping methods and maps. He classifies and describes the classical methods of navigation and technical methods for their implementation. He presents the work principles and performance of navigation devices. He explains principles of work and gives the parameters of satellite navigation system GPS. He discusses principles of functioning of hydroacoustic navigation systems and their applications. He describes the operation of ILS in aviation navigation.	[SW1] Assessment of factual knowledge
Subject contents	<ol style="list-style-type: none"> 1. Introduction and legal framework for action at sea: IMO, SOLAS 2. Marine navigation systems, models of the Earth, the coordinates 3. Mapping systems, digital map, data formats 4. Directions to navigation 5. GPS Navigation System 6. Maritime real-time systems - implementation in Poland 7. The automatic identification of ships AIS-PL 8. Stations Maritime Differential GPS (DGPS-PL) 9. Marine communication systems, GMDSS system 10. Internal communication systems and alarm systems on ships 11. Marine echolocation systems - marine radar, ARPA system, echo sounders, sonars 12. Hydroacoustic systems - environmental conditions of operation 13. Underwater communication systems 14. Local navigation systems, positioning and stabilization of the position 15. Summary - mandatory navigation equipment 		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	test colloquium	50.0%	70.0%
	presence & activity	0.0%	30.0%
Recommended reading	Basic literature	<ol style="list-style-type: none"> 1. W. Salmonowicz, Łączność w niebezpieczeństwie GMDSS, Wyższa Szkoła Morska w Szczecinie, Szczecin 2001 2. R. Wawruch, Uniwersalny statkowy system automatycznej identyfikacji (AIS), Akademia Morska w Gdyni, Gdynia 2002 3. R. Śmierczalski, "Automatyzacja i sterowanie statkiem", Wydawnictwo Politechniki Gdańskiej, Gdańsk 2013 	
	Supplementary literature	<ol style="list-style-type: none"> 1. A. N. Ince et al., Principles of integrated maritime surveillance systems, Springer Science+Business Media, New York 1998 2. COLREGS - International Regulations for Preventing Collisions at Sea, (1972), Lloyd's Register Rulefinder 2005 – Version 9.4 3. SOLAS - International Convention for the Safety of Life at Sea, Lloyd's Register Rulefinder 2005 – Version 9.4 	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		