University of Gdańsk

Subject card

Subject name and code	Navigational equipment - course ARPA, PG_00131523						
Field of study	Marine Hydrography						
Date of commencement of studies	October 2024		Academic year of realisation of subject		2026/2027		
Education level	Bachelor's studies		Subject group		Optional subject group Subject group related to practical vocational preparation		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	3		Language of instruction		Polish		
Semester of study	5		ECTS credits		0.0		
Learning profile	practical		Assessment form		credit		
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Artur Makar				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	2.0	0.0	1.0	1.0	4
	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	4		0.0		0.0	4
Subject objectives	Teaching the principles of operation, operation and effective use of ARPAs, paying attention to their limitations, accuracy and specifications for displaying navigation information						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[HML3-W07] principles of operation and use of measuring instruments used in professional activities related to the field of study, including the principles of their calibration and assessment of accuracy	Knows: - Principles of operation and maintenance of navigation radars. - Principles of radar plotting. - Principles of operation of ARPA devices and their possible use in planning anti-collision maneuvers.	[SW5] implementation of a problem task
[HML3-U11] use navigation devices, means of technical observation and communication as well as measuring instruments, as well as apply in practice various techniques of measurement and observation in the field of professional activity related to the field of study	The student is able to: - Optimize the radar display, correctly interpret the radar image, efficiently identify object echoes on the screen, and proficiently perform radar measurements using available methods while minimizing errors. - Obtain information about objects visible on the radar display, initiate tracking of the object, obtain and correctly interpret information generated by the ARPA system, assess a collision situation, plan and execute an anti-collision maneuver, and verify the effectiveness of the actions taken. - Use ARPA and other navigational devices to conduct safe navigation and avoid collisions in various navigational areas, with particular emphasis on ARPA-AIS-ECDIS information exchange, and take into account the errors and limitations of ARPA devices.	[SU6] demonstration of practical skills
[HML3-U18] work individually and in team, manage the work of the team, in particular comply with health and safety regulations and ergonomics	Can: - Use ARPA and other navigational aids to navigate safely and avoid collisions in various navigational areas, with particular emphasis on ARPA-AIS-ECDIS information exchange, and take into account errors and limitations of ARPA devices.	[SU6] demonstration of practical skills
[HML3-W16] engineering standards and norms specific to the field of study, in particular those recommended by IHO and IMO	knows: - IMO requirements for radar equipment and ARPA, and the dangers of overreliance on ARPA data.	[SW5] implementation of a problem task

Subject contents

IMO technical and operational requirements for radar equipment. Basic phenomena and problems in radiolocation. Construction and operation of marine navigation radar. Interpretation of radar images. Errors and accuracy of radar measurements. Diagnostics of radar performance and preliminary fault location. Digital processing of echoes and its impact on radar imaging. Devices interoperating with navigation radar. Preparing a radar plot - radar report, planning and monitoring the effectiveness of anti-collision maneuvers. Using radar equipment to determine and control a vessel's position. EPA and ATA plotting aids - principle of operation and possible applications. Principle of operation, basic functions, and operation of ARPA. Interpretation of information obtained from ARPA. Testing, errors, and limitations of ARPA equipment. ECDIS-AIS-ARPA interoperability. Using radar equipment in accordance with MPDM regulations to prevent collisions and close approaches.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
	51.0%	100.0%

Recommended reading

Basic literature	1. JANUSZEWSKI J., KON W., WIĘCKOWSKI J.: Praktyka radarowa na małych statkach. Tom I i II. Wydawnictwo Trademar, Gdynia 1997. 2. KON W.: Wykorzystanie radaru do zapobiegania zderzeniom. 1983. 3. WAWRUCH R.: Radar jako pomoc w zapobieganiu zderzeniom na morzu. 1994. 4. WRÓBEL F.: Vademecum oficera wachtowego. Trademar, Gdynia 1999.
Supplementary literature	1. BOLE A. G., DINELEY W. O.: Radar and ARPA Manual. 1998. 2. COCKCROFT A. N., LAMEIJER J.: Collision Avoidance Rulet (fifth edition). 2001.
eResources addresses	

Example issues/ example questions/ tasks being completed

Work placement	Not applicable

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