

Subject card

Subject name and code	Navigational Equipment - course ARPA - lecture, PG_00201144						
Field of study	Marine Hydrography						
Date of commencement of studies	October 2026		Academic year of realisation of subject		2028/2029		
Education level	Bachelor's studies		Subject group		Obligatory subject group in the field of study Optional subject group		
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		2.0		
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	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		1.0		19.0	50
Subject objectives	To teach the principles of operation, use, and effective application of ARPA systems, with particular emphasis on their limitations, accuracy, and the specification of navigational information display.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[HML3-W07] knows and understands, at an advanced level, 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 at an advanced level: - the principles of manual operation of navigational radars; - the principles of preparing radar plots; - the principles of operation of ARPA (Automatic Radar Plotting Aids) devices and their capabilities in collision avoidance maneuver planning		[SW4] test/exam - oral or written		
	[HML3-W16] knows and understands engineering standards and norms specific to the field of study, in particular those recommended by IHO and IMO		knows at an advanced level the IMO requirements regarding radar and ARPA devices, the dangers associated with excessive reliance on ARPA data		[SW4] test/exam - oral or written		
Subject contents	IMO Technical and Operational Requirements for Radar Equipment. Fundamental phenomena and challenges in radar navigation. Structure and operation of marine navigational radar. Interpretation of radar display. Errors and accuracy in radar measurements. Radar performance diagnostics and preliminary fault identification. Digital echo processing and its impact on radar imagery. Devices cooperating with navigational radar. Preparation of radar plotting radar report, planning and monitoring the effectiveness of collision avoidance maneuvers. Use of radar equipment for ship position determination and monitoring. Plotting aids: EPA and ATA principles of operation and applications. ARPA: principles of operation, key functions, and handling. Interpretation of ARPA-derived information. Testing, errors, and limitations of ARPA systems. Integration of ECDIS/ARPA systems. Use of radar systems in accordance with COLREGs to prevent collisions and excessive close-quarter situations.						
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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