

**Subject card**

<b>Subject name and code</b>	Navigational Equipment - course ARPA - lecture, PG_00201144						
<b>Field of study</b>	Marine Hydrography						
<b>Date of commencement of studies</b>	October 2026	<b>Academic year of realisation of subject</b>				2028/2029	
<b>Education level</b>	Bachelor's studies	<b>Subject group</b>				Obligatory subject group in the field of study Optional subject group	
<b>Mode of study</b>	full-time studies	<b>Mode of delivery</b>				at the university	
<b>Year of study</b>	3	<b>Language of instruction</b>				Polish	
<b>Semester of study</b>	5	<b>ECTS credits</b>				2.0	
<b>Learning profile</b>	practical	<b>Assessment form</b>				credit	
<b>Conducting unit</b>							
<b>Name and surname of lecturer (lecturers)</b>	Subject supervisor		dr hab. inż. Artur Makar				
	Teachers						
<b>Lesson types</b>	<b>Lesson type</b>	<b>Lecture</b>	<b>Tutorial</b>	<b>Laboratory</b>	<b>Project</b>	<b>Seminar</b>	<b>SUM</b>
	Number of study hours	30.0	0.0	0.0	0.0	0.0	30
	E-learning hours included: 0.0						
<b>Learning activity and number of study hours</b>	<b>Learning activity</b>	<b>Participation in didactic classes included in study plan</b>		<b>Participation in consultation hours</b>		<b>Self-study</b>	<b>SUM</b>
	Number of study hours	30		1.0		19.0	50
<b>Subject objectives</b>	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.						
<b>Learning outcomes</b>	<b>Course outcome</b>		<b>Subject outcome</b>			<b>Method of verification</b>	
	[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	
<b>Subject contents</b>	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.						
<b>Prerequisites and co-requisites</b>							

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 Ruleet (fifth edition). 2001.	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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