University of Gdańsk

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 ECDISAISARPA systems.Use of radar systems in accordance with COLREGs to prevent collisions and excessive close-quarter situations.

Prerequisites and co-requisites

<table>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td></td><td>51.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>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.</td></tr>
<tr><td>Supplementary literature</td><td>1. BOLE A. G., DINELEY W. O.: Radar and ARPA Manual. 1998.
2. COCKCROFT A. N., LAMEIJER J.: Collision Avoidance Rulet (fifth edition). 2001.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2"></td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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