University of Gdańsk

Subject card

Subject name and code	Oceanographic Methods Used in Marine Hydrography - lecture, PG_00201146		
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	1.0
Learning profile	practical	Assessment form	credit
Conducting unit	Laboratory of Marine Geology -> Department of Chemical Oceanography and Marine Geology -> Faculty of Oceanography and Geography -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Ewa Szymczak	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	12.0	0.0	0.0	0.0	0.0	12

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	12	1.0	12.0	25

Subject objectives

To improve theoretical and practical knowledge of underwater sound sources, in particular related to signal processing and interpretation of the results obtained. To understand the role of the marine hydrographer in work related to the use of non-invasive methods of surveying the seabed surface, based on underwater unmanned platforms, for the detection of anthropogenic objects present on the seabed.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[HML3-K01] is ready to correctly identify and resolve professional dilemmas, especially in the aspects of security and entrusted property	is prepared to correctly identify factors that enable the safe use of equipment such as hydrophones and unmanned underwater vehicles in the detection of anthropogenic pollution of the marine environment in the form of underwater noise and bottom objects	[SK2] presentation/project/paper/ report
[HML3-W04] knows and understands, at an advanced level, the issue of measurements related to the exploration of sea basins and inland waters and tools allowing to describe, interpret and present the results of measurements	knows at an advanced level the methods for studying anthropogenic marine pollution in the form of underwater noise and objects found on the seabed	[SW2] presentation/project/paper/ report

Subject contents

Sources of sound in the sea (natural, biological and anthropogenic). Sound recording in the marine environment. Noise recording with a hydrophone and processing of the data thus collected. Analysis of acoustic signals. Frequency characteristics of individual acoustic sources. Interpretation of the spectrum of sounds in the sea. Indicators describing noise in the environment. Locating acoustic sources using hydrophone antennas. Problems of anthropogenic objects occurring on the sea bed (types, origin, hazards associated with them). Types of unmanned underwater vehicles and their equipment. Tools and methods for detection of anthropogenic objects on the seabed based on unmanned underwater vehicles. Mission planning of unmanned underwater vehicles.

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="2"></td></tr>
<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>presentation</td><td>51.0%</td><td>90.0%</td></tr>
<tr><td>attendance in classes</td><td>85.0%</td><td>10.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>Clay C. S. and Medwin H., 1977. Acoustical Oceanography: Principles and Applications. Wiley, New York.

Medwin H., 2005. Sounds in the sea. From ocean acoustics to acoustical oceanography. Cambridge University Press, New York.

Lurton X., 2002. An introduction to underwater acoustics. Principles and applications. Springer Berlin, Heidelberg.

Salamon R., 2006. Hydrolocation systems. Gdańskie Towarzystwo Naukowe, Gdańsk.</td></tr>
<tr><td>Supplementary literature</td><td>Bełdowski J., Been R., Turmus E., 2017 Towards the Monitoring of Dumped Munitions Threat (MODUM): A study of Chemical Munition Dumpsites in the Baltic Sea. NATO Science for Peace and Security Series C: Environmental, Springer</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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