University of Gdańsk

Subject card

Subject name and code	Introduction to Marine Acoustics - lecture, PG_00205340		
Field of study	Oceanography		
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 Subject group related to scientific research in the field of study
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	academic	Assessment form	credit
Conducting unit	Department of Physical Oceanography and Climate Research -> Faculty of Oceanography and Geography -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Jakub Idczak	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	25.0	0.0	0.0	0.0	0.0	25

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	25	2.0	23.0	50

Subject objectives

To familiarize students with the basic phenomena relating to the propagation of acoustic waves in the sea and their generation and reception.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[OCEANL3-U01] is able to use the current scientific terminology in the field of oceanography in various forms of expression	Is able to correctly use current scientific terminology in various forms of expression in the field of marine acoustics	[SU4] test/exam - oral or written
[OCEANL3-W01] has an advanced knowledge and understanding of the terminology used in oceanography and related exact and natural sciences (in Polish and a selected foreign language)	Has an advanced knowledge and understanding of the terminology used in hydroacoustics	[SW4] test/exam - oral or written
[OCEANL3-W04] has an advanced understanding of issues and research problems in oceanography, and recognizes their connection with other scientific disciplines	Knows and understands the most important research problems in the field of marine acoustics and their connections with other fields of oceanography	[SW4] test/exam - oral or written
[OCEANL3-W05] has an advanced knowledge of techniques, research methods, and tools (mathematical, statistical, and computational) used by oceanographers to describe and interpret processes and phenomena occurring in the marine environment	Knows and understands the importance of innovative remote hydroacoustic techniques used in interdisciplinary research and monitoring of the marine environment	[SW4] test/exam - oral or written
[OCEANL3-U04] is able to independently search for information in Polish and foreign specialist literature, as well as on the Internet and in databases	Is able to independently search for information on marine acoustics in Polish and English specialist literature, as well as on the Internet and databases	[SU4] test/exam - oral or written

Subject contents

1 Acoustic wave: definition, parameters characterizing an acoustic wave (spatial and temporal changes). 2 Acoustic wave propagation: geometric propagation (traveling waves: plane, cylindrical, spherical waves), sound absorption in sea water. 3 Wave phenomena: wave interference phenomenon, reflection and transmission of waves at the boundary of two media, refraction of acoustic waves, scattering of acoustic waves. 4 Acoustic transducers. 5 Principle of operation of selected acoustic devices and their application (single- and multi-beam echosounder, ADCP). 6 Acoustic data processing. 7 Selected applications of acoustic methods for studying marine ecosystems.

Prerequisites and co-requisites

Assessment methods and criteria

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

Recommended reading

Basic literature	1. Clay C. S. and Medwin H., 1977. Acoustical Oceanography: Principles and Applications. Wiley, New York, 544. 2. Medwin H. and Clay C. S., 1998. Fundamentals of Acoustical Oceanography. Academic Press, Boston, 712. 3. Medwin H., 2005. Sounds in the Sea. From Ocean Acoustics to Acoustical Oceanography. Cambridge University Press, New York, 643. 4. Śliwiński A., 2001. Ultradźwięki i ich zastosowania. Wyd. Nauk.-Tech., Warszawa (in Polish)
Supplementary literature	1. Tolstoy I., Clay C. S., 1966. Ocean acoustics: Theory and experiments in underwater sound. McGraw-Hill. 2. MacLennan D. N., Simmonds E. John, 2005. Fishery Acoustics. Blackwell Science
eResources addresses	

Example issues/ example questions/ tasks being completed

Work placement

Not applicable

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