

Subject card

Subject name and code	Introduction to marine acoustics - lecture, PG_00159319						
Field of study	Oceanography						
Date of commencement of studies	October 2025		Academic year of realisation of subject			2027/2028	
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		10.0		15.0	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 correctly use current scientific terminology in various forms of expression in the field of marine acoustics			[SU4] test/exam - oral or written	
	OCEANL3-W05		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 on marine acoustics in Polish and English specialist literature, as well as on the Internet and databases			[SU4] test/exam - oral or written	
	OCEANL3-W04		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-W01		Has an advanced knowledge and understanding of the terminology used in hydroacoustics			[SW4] 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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