University of Gdańsk

Subject card

Subject name and code	Introduction to marine acoustics - lecture, PG_00159319		
Field of study	Oceanography		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2026/2027
Education level	undergraduate studies	Subject group	Obligatory subject group 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	
Conducting unit	Katedra Oceanografii Fizycznej i Badań Klimatu -> Faculty of Oceanography and Geography		
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.

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="3"></td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>exam</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 colspan="2">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)</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">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</td></tr>
<tr><td>eResources addresses</td><td colspan="2">Adresy na platformie eNauczanie:</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3"></td></tr>
<tr><td>Work placement</td><td colspan="3">Not applicable</td></tr>
</table>

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