University of Gdańsk

Subject card

Subject name and code	Marine Acoustics - laboratory, PG_00206205		
Field of study	Oceanography		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
Education level	Master'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	1	Language of instruction	Polish
Semester of study	1	ECTS credits	1.0
Learning profile	academic	Assessment form	credit
Conducting unit	Department of Geophysics -> Faculty of Oceanography and Geography -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. Jarosław Tęgowski	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	0.0	10.0	0.0	0.0	10

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	10	1.0	14.0	25

Subject objectives

1. Demonstrating the effectiveness of innovative remote hydroacoustic techniques in interdisciplinary marine environmental research (extended scope)
2. Familiarizing students with the practical applications of innovative remote hydroacoustic techniques for monitoring the marine environment for its sustainable exploitation and effective management (extended scope).
3. Transferring knowledge and developing the skills necessary to conduct natural science research and effective practical use of hydroacoustic techniques (extended scope)

Learning outcomes

Course outcome	Subject outcome	Method of verification
[OCEANMU2-K03] is ready to effectively organize his/her own work, is active and persistent and punctuality in completing tasks, is ready to carrying out evaluation of their own activities	is ready to organize his/her work effectively, is active, and is persistent and punctual in completing tasks related to the subject of marine acoustics	[SK2] presentation/project/paper/ report
[OCEANMU2-U06] is able to use specialized computer software as well as advanced mathematical and statistical methods to analyze data and describe processes and phenomena occurring in the marine and coastal environment; evaluates their reliability and usefulness and performs critical analysis	is able to use specialised software to analyse hydroacoustic data	[SU2] presentation/project/paper/ report
[OCEANMU2-U04] is ready to develop in an analytical and synthetic way research and analysis results and based on them creating conclusions	is able to analytically and synthetically compile, in-class, the results of acoustic analyses	[SU2] presentation/project/paper/ report
[OCEANMU2-U03] can plan and carry out independently advanced research and measurements, both in field and laboratory, using appropriately selected measurement and analytical techniques in the field of oceanography, adequately to the studied specialty and research problem	can independently plan and conduct advanced acoustic tests and measurements in the laboratory	[SU2] presentation/project/paper/ report [SU6] demonstration of practical skills
[OCEANMU2-W05] knows and understands the principles of planning and conducting field and laboratory research as well as advanced methods and tools of scientific research, especially in the field of the studied specialty	has an in-depth understanding of basic and advanced techniques, research methods, and tools (mathematical, statistical, IT) used in hydroacoustics to analyze phenomena and processes occurring in the marine environment and in the work of an oceanographer conducting hydroacoustic monitoring of marine ecosystems	[SW2] presentation/project/paper/ report

Subject contents

Demonstration of the capabilities of programs designed for hydroacoustic data processing. Program operation.

Prerequisites and co-requisites

Knowledge of higher mathematics and the fundamentals of physics is essential.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
carrying out the measurements	51.0%	30.0%
laboratory reports	51.0%	70.0%

Recommended reading

Basic literature	1.Lurton X., 2002. An Introduction to Underwater Acoustics. Principles and Applications, Springer 2. Clay C. S. and Medwin H., 1977. Acoustical Oceanography: Principles and Applications. Wiley, New York 3. Medwin H. and Clay C. S., 1998. Fundamentals of Acoustical Oceanography. Academic Press, Boston 4. Medwin H., 2005. Sounds in the Sea. From Ocean Acoustics to Acoustical Oceanography. Cambridge University Press, New York 5. Śliwiński A., 2001. Ultradźwięki i ich zastosowania, Wyd. NT, Warszawa 6. Brekhovskikh, L.M., Lysanov, Yu.P., 2003, Fundamentals of Ocean Acoustics, Springer 7. Urick R. J., 1975. Principles of underwater sound, McGraw-Hill studiowana samodzielnie przez studenta 1. Selected chapters in books 1 to 7 in the above list 2. http://hyperphysics.phy-astr.gsu.edu/hbase/sound/soucon.html 3. http://www.physicsclassroom.com/Class/sound/soundtoc.html 4. http://www.dosits.org/science/intro.htm 5. Selected scientific papers in Polish and English 6. Stepnowski A., 2001. Systemy akustycznego monitoringu środowiska morskiego. Gd. Tow. Nauk., Gdańsk, 283.
Supplementary literature	Tolstoy I., Clay C. S., 1966. Ocean acoustics: Theory and experiments in underwater sound. McGraw-Hill.
eResources addresses	

Example issues/ example questions/ tasks being completed	The use of innovative remote acoustic methods for monitoring the marine environment for its sustainable exploitation and effective management.
Work placement	Not applicable

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