

Subject card

Subject name and code	Mineral resources of seas and oceans - lecture, PG_00159316						
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				
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	Pracownia Geologii Morza -> Katedra Oceanografii Chemicznej i Geologii Morza -> Faculty of Oceanography and Geography						
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	30.0	0.0	0.0	0.0	0.0	30
	E-learning hours included: 0.0						
	Additional information: wykład z prezentacją multimedialną						
	wykład z dyskusją						
	oxford debate						
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	30		5.0		25.0	60
Subject objectives	Knowledge of geological conditions for the formation and occurrence of deposits. Familiarisation with the geological structure of the most important and largest Polish and world deposits discussed according to the technological classification: energetic, metallic, chemical and rock raw materials. The legal basis of mineral exploitation, the effects of raw material exploitation in the marine environment.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	OCEANL3-W02	knows and understands the geological, chemical, biological and physical processes occurring in the marine environment, and characterises the effects of these processes on the distribution of deposits	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
	OCEANL3-W01	to an advanced degree, knows and understands the terminology used in describing oceanic mineral resources	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
	OCEANL3-U01	be able to use current scientific terminology of knowledge of oceanic raw materials, their origins and classification in various forms of expression	[SU1] oral statement/conversation/ discussion [SU4] test/exam - oral or written
	OCEANL3-W08	knows the legal basis for the exploitation of oceanic minerals and the activities of the International Seabed Authority	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
	OCEANL3-W06	knows and understands the principles of the management of the marine environment and its resources resources, recognises the impact and effects of mineral exploitation on the marine environment	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
Subject contents	Methods of exploration of the ocean floor and mineral deposits. Legal basis for the use of oceanic minerals. Genesis of minerals. Distribution of polymetallic mineral deposits and their resources. Distribution of energy mineral deposits and their resources. Distribution of chemical mineral deposits and their resources. Occurrence and exploitation of gemstones. Distribution of rock mineral deposits and their resources. Forecast development of deposits. Exploitation of the resources from the bottom of the seas and oceans and its impact on the natural environment.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	written assessment	51.0%	100.0%
Recommended reading	Basic literature	Depowski S., Kotliński R., Rühle E., Szamalek K., 1998. Mineral resources of the seas and oceans, Wyd. Naukowe Scholar, Warszawa. Gurvich Evgeny G., 2006. Metalliferous Sediments of the World Ocean, Springer Mizerski W., Szamalek K., 2009. Geology and Mineral Resources of the Oceans, Wyd. Naukowe PWN, Warszawa Kotliński R., Mucha J., Wasilewska M., 2008. Problems of resource estimation of polymetallic nodule deposits in the Pacific. Gospodarka surowcami mineralnymi, 24 (2/4) Marine Resources - Opportunities and Risks. World Ocean Review 3. 2014.	
	Supplementary literature	Max Michael D., Johnson Arthur H., Dillon William P., 2006. Economic Geology of Natural Gas Hydrate, Springer Kotliński R., 1999. Metallogenesis of the worlds ocean against the background of ocean crust evolution. Polish Geological Institute Special Papers, 4: 170 Piestrzyński A., 2011. Ocean Mineral Resources, Mining and Geoengineering, 35 (4/1) Mucha J. Kotliński R., Wasilewska-Błaszczuk M., 2011. Methodology for estimating resource parameters of polymetallic nodule deposits in the Pacific Interoceanmetal area. Zeszyty Naukowe Instytutu Gospodarki Surowcami Mineralnymi i Energią Polskiej Akademii Nauk, 81	

	eResources addresses	Podstawowe https://www.isa.org.jm/ - website of International Seabed Authority Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	Name the polymetallic minerals found on the ocean floor Describe the effects of oil exploitation in the marine environment	
Work placement	Not applicable	

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