

Subject card

Subject name and code	Mineral resources of seas and oceans, PG_00091087						
Field of study	Geology						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2026/2027		
Education level	Bachelor's 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			credit		
Conducting unit	Laboratory of Marine Geology -> Department of Chemical Oceanography and Marine Geology -> Faculty of Oceanography and Geography -> Rector						
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: lecture with multimedia presentation lecture with discussion 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		4.0		16.0	50
Subject objectives	Knowledge of the conditions for the formation of mineral resources in the marine environment, their occurrence in the world ocean, resources and the possibilities of exploitation. Legal basis of mineral exploitation, effects of raw material exploitation in the marine environment.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[GEOLL3_W02] knows and understands the terminology appropriate in science and natural sciences	knows the basic concepts and terms used in describing oceanic raw materials, their genesis, classification	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
	[GEOLL3_W07] knows the anthropogenic transformation of the natural environment, including the effects of the exploitation of mineral resources	knows the impact and effects of mineral exploitation on the marine environment	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
	[GEOLL3_W01] knows and understands the basic natural phenomena and explains their course in relation to geological processes	knows and notes the relationship between the formation of the raw materials of the seas and oceans and physical, chemical and biological processes, and characterises the influence of these processes on the distribution of deposits	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
	[GEOLL3_W04] knows and understands phenomena and processes occurring in the past and today in the interior of the Earth and on its surface, defines the methods of how to study them	knows and understands the influence of plate tectonics on the formation and destruction of deposits, and is familiar with methods of oceanic mineral exploration	[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	<p>Depowski S., Kotliński R., Rühle E., Szamałek K., 1998. Mineral resources of the seas and oceans, Wyd. Naukowe Scholar, Warszawa.</p> <p>Gurvich Evgeny G., 2006. Metalliferous Sediments of the World Ocean, Springer</p> <p>Mizerski W., Szamałek K., 2009. Geology and Mineral Resources of the Oceans, Wyd. Naukowe PWN, Warszawa</p> <p>Kotliński R., Mucha J., Wasilewska M., 2008. Problems of resource estimation of polymetallic nodule deposits in the Pacific. <i>Gospodarka surowcami mineralnymi</i>, 24 (2/4)</p> <p>Marine Resources - Opportunities and Risks. <i>World Ocean Review</i> 3. 2014.</p>	
	Supplementary literature	<p>Max Michael D., Johnson Arthur H., Dillon William P., 2006. <i>Economic Geology of Natural Gas Hydrate</i>, Springer</p> <p>Kotliński R., 1999. Metallogenesis of the worlds ocean against the background of ocean crust evolution. <i>Polish Geological Institute Special Papers</i>, 4: 170</p> <p>Piastrzyński A., 2011. <i>Ocean Mineral Resources, Mining and Geoengineering</i>, 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. <i>Zeszyty Naukowe Instytutu Gospodarki Surowcami Mineralnymi i Energią Polskiej Akademii Nauk</i>, 81</p>	

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

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