

**Subject card**

<b>Subject name and code</b>	Mineral resources of seas and oceans - lecture, PG_00193042						
<b>Field of study</b>	Geology						
<b>Date of commencement of studies</b>	October 2026	<b>Academic year of realisation of subject</b>			2028/2029		
<b>Education level</b>	Bachelor's studies	<b>Subject group</b>			Obligatory subject group in the field of study		
<b>Mode of study</b>	full-time studies	<b>Mode of delivery</b>			at the university		
<b>Year of study</b>	3	<b>Language of instruction</b>			Polish		
<b>Semester of study</b>	5	<b>ECTS credits</b>			2.0		
<b>Learning profile</b>	academic	<b>Assessment form</b>			credit		
<b>Conducting unit</b>	Laboratory of Marine Geology -> Department of Chemical Oceanography and Marine Geology -> Faculty of Oceanography and Geography -> Rector						
<b>Name and surname of lecturer (lecturers)</b>	<b>Subject supervisor</b>		dr Ewa Szymczak				
	<b>Teachers</b>						
<b>Lesson types</b>	<b>Lesson type</b>	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	<b>Number of study hours</b>	30.0	0.0	0.0	0.0	0.0	30
	E-learning hours included: 0.0						
<b>Learning activity and number of study hours</b>	<b>Learning activity</b>	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	<b>Number of study hours</b>	30		1.0		19.0	50
<b>Subject objectives</b>	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.						
<b>Learning outcomes</b>	<b>Course outcome</b>		<b>Subject outcome</b>		<b>Method of verification</b>		
	[GEOLL3_W02] knows and understands the terminology appropriate in science and natural sciences		defines terms and concepts used in describing oceanic raw materials, their origins, 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		explains 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		analyses 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		identifies the influence of plate tectonics on the formation and destruction of deposits in the seas and oceans, characterises the methods of geological research leading to the identification of oceanic minerals		[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		
Example issues/ example questions/ tasks being completed	<p>Name the polymetallic minerals found on the ocean floor</p> <p>Describe the effects of oil exploitation in the marine environment</p>		
Work placement	Not applicable		

Document generated electronically. Does not require a seal or signature.