



Subject card

Subject name and code	Energetic and Chemical Raw Materials, PG_00060855						
Field of study	Chemical Technology						
Date of commencement of studies	October 2024		Academic year of realisation of subject		2025/2026		
Education level	first-cycle studies		Subject group		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	2		Language of instruction		Polish		
Semester of study	3		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Process Engineering and Chemical Technology -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. inż. Anna Zielińska-Jurek				
	Teachers		dr inż. Anna Grzegórska prof. dr hab. inż. Anna Zielińska-Jurek				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	E-learning hours included: 0.0						
	eNauczanie source addresses: Moodle ID: 1708 Surowce energetyczne i chemiczne https://enauczanie.pg.edu.pl/2025/course/view.php?id=1708						
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		2.0		18.0	50
Subject objectives	During the course, the student will gain knowledge, skills and competences in the field of raw material acquisition, key, strategic and critical raw materials, the state's raw material policy and the use of waste as raw materials. At the same time, the student will gain theoretical, technological and engineering knowledge of an interdisciplinary nature regarding mineral and energy resources.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W05] has knowledge of chemical technology based on mineral or energy resources and modern energy sources, understands the concept of sustainable development, knows the principles of green chemistry and environmentally friendly process engineering, has knowledge of occupational safety in the chemical industry		The student possesses knowledge of the impact of mineral processing and raw material production processes on their application in the chemical industry, with particular emphasis on the environmental impact of these processes.		[SW1] Assessment of factual knowledge		
	[K6_U11] individually plans and implements his/her own learning		Uses chemical terminology to the extent necessary to present (in written and oral form) the subject curriculum content.		[SU5] Assessment of ability to present the results of task		
	[K6_K02] understands the non-technical aspects and implications of the activities of a chemical engineer, including the impact on the environment, is aware of professional behaviour, observance of professional ethics and respect for diversity of views and cultures		The student is prepared to critically assess the suitability and modes of operation of existing engineering and technological solutions in the chemical industry, taking into account the properties of the raw materials used.		[SK2] Assessment of progress of work [SK5] Assessment of ability to solve problems that arise in practice		

Subject contents	<p>Course content – lecture</p> <p>Classification of raw materials. Basic groups of raw materials: chemical, energy, metal and mineral raw materials. Raw materials of the chemical industry. Sources of raw materials for the chemical industry, methods of enriching fossil raw materials, preparation of raw materials for the technological process. Energy raw materials. Types of fuels, production of artificial fuels, raw materials used in nuclear energy, biogas, fuel combustion. Unconventional energy sources. Mineral raw materials. Limestone, gypsum, kaolins and clays. Processed mineral raw materials. Mineral pigments in chemical technology and their use. Obtaining raw materials from anthropogenic deposits and supporting the development of a circular economy. Metallic raw materials: their specific properties, industrial importance, the most important elements of processing, occurrence in the country and around the world. Synthetic minerals produced in industrial conditions. Resources of the seas and oceans. Key, strategic and critical raw materials. State raw material policy. Application of waste as raw materials Grinding of materials Selected methods of testing mineral raw materials: microscopic analysis, X-ray analysis, thermal analysis, dynamic light scattering and zeta potential analysis. Energy production from unconventional sources.</p> <p>Course content – laboratory</p> <p>Identification of minerals, rocks, and energy resources</p> <p>Raw material crushing</p> <p>Production of mineral pigments</p> <p>Raw material enrichment - flotation</p> <p>Selected mineral resource testing methods: microscopic analysis, X-ray analysis, thermal analysis, dynamic light scattering analysis, and zeta potential analysis.</p> <p>Energy production from unconventional sources.</p>		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Laboratory: practical exercises, tests, reports on exercises performed	50.0%	40.0%
	lectures	50.0%	60.0%
Recommended reading	Basic literature	1. Praca zbiorowa: Bilans gospodarki surowcami mineralnymi Polski i świata 2001-2005. Wyd. PAN, Instytut Gospodarki Surowcami Mineralnymi i Energią, Kraków, 2007. 2. Magda. R: Międzynarodowe rynki metali i surowców mineralnych. Wyd. AGH, Kraków, 2006. 3. Manecki A. Encyklopedia minerałów. Wyd. AGH, Kraków, 2004. 4. Drzymała J., Podstawy mineralurgii, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław, 2001.	
	Supplementary literature	brak	
	eResources addresses		
Example issues/ example questions/ tasks being completed	<p>Discuss the sources of iron in the Earth's crust List the main lime raw materials used in chemical technology and, using a selected example, discuss the process of their use.</p> <p>Explain the concept of clay raw materials and discuss the methods of using clay raw materials for the production of ceramics.</p> <p>List and, using a selected example, describe the products of wood processing</p> <p>List the raw materials and techniques used in the production of pigments</p>		
Practical activities within the subject	Not applicable		

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