GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Energetic and Chemical Raw Materials, PG_00060855		
Field of study	Chemical Technology		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2027/2028
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		

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

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_K02] is aware of the responsibility for his/her work and is ready to work in a team and share responsibility for common tasks.	understands the importance of professional responsibility in the field of energy and chemical raw materials and is prepared for effective teamwork, including shared responsibility for the completion of assigned tasks.	[SK1] Assessment of group work skills [SK5] Assessment of ability to solve problems that arise in practice
[K6_W07] Has knowledge of raw materials and technologies in the chemicaland polymer industries, also covering issues of corrosion and material protection.	has knowledge, skills, and competencies in the areas of raw material procurement, key, strategic, and critical raw materials, national raw materials policy, and the use of waste as raw materials; also has interdisciplinary theoretical, technological, and engineering knowledge regarding mineral and energy resources.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects

<table>
<tr><td>Subject contents</td><td>Course content – lecture
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.
Course content – laboratory
Identification of minerals, rocks, and energy resources
Raw material crushing
Production of mineral pigments
Raw material enrichment - flotation
Selected mineral resource testing methods: microscopic analysis, X-ray analysis, thermal analysis, dynamic light scattering analysis, and zeta potential analysis.
Energy production from unconventional sources.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Laboratory: practical exercises, tests, reports on exercises performed</td><td>50.0%</td><td>40.0%</td></tr>
<tr><td>lectures - tests</td><td>50.0%</td><td>60.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>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.</td></tr>
<tr><td>Supplementary literature</td><td>brak</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>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.

Explain the concept of clay raw materials and discuss the methods of using clay raw materials for the production of ceramics.

List and, using a selected example, describe the products of wood processing

List the raw materials and techniques used in the production of pigments</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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