



## Subject card

Subject name and code	Inorganic technology, PG_00060868						
Field of study	Chemical Technology						
Date of commencement of studies	October 2023		Academic year of realisation of subject		2025/2026		
Education level	first-cycle studies		Subject group		Obligatory subject group in the field of study 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	3		Language of instruction		Polish		
Semester of study	5		ECTS credits		3.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Department of Process Engineering and Chemical Technology -> Faculty of Chemistry -> Wydział Politechniki Gdańskiej						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Marek Lieder				
	Teachers		dr hab. inż. Marek Lieder				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	15.0	0.0	0.0	0.0	45
	E-learning hours included: 0.0						
	eNauczanie source addresses: Moodle ID: 46401 Technologia Nieorganiczna - 2025/2026 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=46401">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=46401</a>						
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	45		2.0		28.0	75
Subject objectives	Student learns practical aspects of technological processes in chemical industry. Student can apply theoretical knowledge to technology.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_W03] has knowledge of environmental protection in chemical technology, the classification of technological processes in terms of their environmental impact and how to eliminate the environmental impact of technological installations	Understands the environmental aspects of the impact of chemical technology on the environment and knows how to eliminate potential hazards.	[SW1] Assessment of factual knowledge
	[K6_K01] understands the need for continuing education, and is aware of the opportunities to improve professional, personal and social competences	The student is able to independently expand their knowledge and professional skills in line with their personal and social goals.	[SK3] Assessment of ability to organize work [SK2] Assessment of progress of work
	[K6_U05] recognises and identifies the relationship between technological issues, implemented in industrial practice, and their impact on various elements of the environment, in the context of mechanisms and conditions of sustainable development, recognizes their systemic and non-technical aspects	Student understands that chemical technology is an applied, interdisciplinary science, which propose conditions and technological schemes for obtaining the desired chemical products in an optimal, environmentally friendly manner, taking into account the appropriate scale of production and acceptable costs.	[SU3] Assessment of ability to use knowledge gained from the subject
	[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	Has knowledge of inorganic technology related to the production of phosphoric, sulfuric, and nitric acids, as well as the production of artificial fertilizers, ammonia, sodium hydroxide, chlorine, and hydrogen. He is familiar with REACH regulations concerning chemical safety, i.e., a high level of protection for human health and the environment against the risks posed by chemical substances/preparations during production and use.	[SW1] Assessment of factual knowledge
Subject contents	1. Technology of soda ash  2. Production of sulphuric acid  3. Technology of phosphorus, inorganic compounds of phosphorus and phosphates.  4. Technology of inorganic compounds of nitrogen - synthesis of ammonia, nitric acid and urea.  5. Technology of combustion and energy conversion  6. Technology of chlorine production  7. Technology of water  8. Metallurgical processes  9. Hydrogen technologies		
Prerequisites and co-requisites	Basics of Chemical technology. Introductory level.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	midterm colloquiums	60.0%	40.0%
	written exam	60.0%	60.0%

Recommended reading	Basic literature	1. Bortel E., Koneczny H. Zarys technologii chemicznej Wydawnictwo Naukowe PWN Warszawa 1992 2. Kępiński J. Technologia chemiczna nieorganiczna Państwowe Wydawnictwo Naukowe Warszawa 1984 3. Schmidt-Szałowski K., Sentek J. Podstawy technologii chemicznej. Organizacja procesów produkcyjnych Oficyna Wydawnicza Politechniki Warszawskiej Warszawa 2001 4. Schmidt-Szałowski K., Sentek J., Raabe J., Bobryk E. Podstawy technologii chemicznej. Procesy w przemyśle nieorganicznym Oficyna Wydawnicza Politechniki Warszawskiej Warszawa 2004 5. Praca zbiorowa pod redakcją K. Schmidt-Szałowskiego Podstawy technologii chemicznej. Bilanse procesów technologicznych Oficyna Wydawnicza Politechniki Warszawskiej Warszawa 1997 6. Kowalski W., Nowe kierunki w technologii kwasu siarkowego, WNT Warszawa 1980
	Supplementary literature	No requirements
	eResources addresses	
Example issues/ example questions/ tasks being completed	<p>1. Explain why coke is considered to be a 'dirty' (unecological) fuel, but methane is not.</p> <p>2. Inside an installation for bicarbonate production circulate three gases. What's their role, and how they enter the system?</p> <p>3. We need nitrogen and hydrogen (synthetic gas) for ammonia production. How is hydrogen produced? Are there any chemical reactions involved during hydrogen mixing with nitrogen?</p> <p>4. Is there any alkalization of the electrolyte during chlorine production by mercury electrolysis? Explain</p> <p>5. Both technologies for phosphoric acid production employ recirculation of the acid. Why?</p> <p>6. Nitric acid production:</p> <p>a) write three reaction of ammonia combustion</p> <p>b) why do we use the 11% concentration of ammonia with the air</p> <p>c) what a catalyst is employed? Are there any support for the catalyst?</p> <p>e) Which installation is better (more efficient): the one operating at low or high pressure? Explain.</p>	
Work placement	Not applicable	

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