



## Subject card

Subject name and code	APPLIED CHEMISTRY, PG_00037445						
Field of study	Chemistry						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2023/2024		
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	2	Language of instruction			Polish		
Semester of study	4	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Process Engineering and Chemical Technology -> Faculty of Chemistry						
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	0.0	0.0	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	5.0		40.0		75
Subject objectives	Student gains competent engineering knowledge in the field of basic applied chemistry						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K6_W02	Student is capable of adopting theoretical knowledge of chemistry for understanding, describing and explaining physical and chemical processes conducted in a chemical industry.			[SW1] Assessment of factual knowledge		
	[K6_U01] knows how to get information from literature, databases and other sources, can integrate the information obtained, interpret and critically evaluate it, and draw conclusions, and to formulate and justify the opinions	Student applies knowledge available in scientific data bases			[SU2] Assessment of ability to analyse information		
	[K6_K02] is aware of the importance of the beyond-technical aspects and effects of engineering activities, including its environmental impact and the associated responsibility for the decisions made	Student understands that the chemical activity may affect the environment, and takes responsibility for his/her own decisions			[SK2] Assessment of progress of work		
Subject contents	1. The concept of sustainable development - green chemistry 2. Materials (types, structure, chemical and surface properties) 3. Chemicals for special applications (inorganic, organic, ceramic, hybrid etc.). Production, application, environmental impact, disposal. 4. The functional and protective coatings. 5. The surface active substances. Production and application. 6. Water - technological aspects of utilization and purification 7. Energy (thermal, electrical, and mechanical)						
Prerequisites and co-requisites	General chemistry - introductory level						
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade		
	Written examination	60.0%			100.0%		

Recommended reading	Basic literature	1. R. Bogoczek, E. Kociołek - Balawejder: Technologia Chemiczna Organiczna: Surowce i Półprodukty, Wydaw. Akademii Ekonomicznej, Wrocław, 1992 2. M. Taniewski: Przemysłowa Synteza Organiczna: Kierunki Rozwoju, Politechnika Śląska, Gliwice, 1999 3. J. Kępiński: Technologia Chemiczna Nieorganiczna, PWN, 1977 4. H. L. White: Introduction to Industrial Chemistry, Wiley, 1987 5. A. Kowalewicz: Podstawy Procesów Spalania, WNT, 2000 6. W. Kordylewski: Spalanie i Paliwa, Politechnika Wrocławska, 1999 7. A. Podniąło: Paliwa, Oleje i Smary w Ekologicznej Eksploatacji, WNT, 2002 8. R. Dylewski, W. Gnot i M. Gonet: Elektrochemia Przemysłowa. Wybrane Procesy i Zagadnienia, Politechnika Śląska, 1999 9. A. M. Anielak: Chemiczne i Fizykochemiczne Oczyszczanie Ścieków, PWN, 2002
	Supplementary literature	1. T. Pompowski: Technologia Chemiczna Nieorganiczna, PWN, 1972 2. A. Kwiatkowski, A. Kołodziejczyk, W. Nierzwicki: Technologia Chemiczna Ogólna i Organiczna, Politechnika Gdańska, 1986 3. M. J. Sienko i R. A. Plane: Chemia: Podstawy i zastosowania, WNT, 1999 4. J. Prejzner: Chemia z Elementami Chemii Środowiska, Politechnika Gdańska, 1996 5. H. Brock: Historia chemii, Prószyński i S-ka, Warszawa 1999
	eResources addresses	Adresy na platformie eNauczanie: Chemia Stosowana - 2023/2024 - Moodle ID: 37181 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=37181">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=37181</a>
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> <li>1. Why is H<sub>2</sub>S a gas, while water is liquid at normal pressure and temperature?</li> <li>2. Temperatures of condensation for O<sub>2</sub> and Cl<sub>2</sub> are equal to 90 and 239 K, respectively. What is the reason of such a great difference?</li> <li>3. Write the reactions of hydrogen and chlorine evolution during brine electrolysis (solid cathode)</li> <li>4. Name two inorganic acids which are produced with the use of catalysts. Write down the reactions and chemical composition of the catalysts.</li> <li>5. What is a basic material used for the synthesis of nitric acid? What type of conversion does it undergo in the first step of the process? (reactions or description)</li> <li>6. Phosphoric acid is produced in industry by two different technologies. The first one is localy, whereas the second - globally unecological. Do you agree with this view? What are these technologies called?</li> <li>7. What are atomic scale transformations related to adhesion?</li> <li>8. Can nickel coatings be chemically deposited on plastics?</li> <li>9. What a parameter decides whether a mixture of hydrocarbons is called a petrol?</li> </ol>	
Work placement	Not applicable	