



Subject card

Subject name and code	Basis of chemical technology, PG_00057678						
Field of study	Green Technologies						
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. Justyna Łuczak				
	Teachers		dr hab. inż. Justyna Łuczak dr inż. Robert Aranowski 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	15.0	0.0	0.0	45
	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	45		2.0		28.0	75
Subject objectives	To gain knowledge of the practical application of engineering science and technology, applying principles, techniques and equipment to the design and production of various goods and services. The goal is also for the Student to gain the ability to view technological processes as a set of technical, organizational and economic issues and to become familiar with selected processes of the chemical industry						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U02] is able to operate equipment and perform typical analyzes of studies of environmental pollution, is able to carry out an analysis of typical environmental pollution and simple devices according to specification		The student is able to select the chemical concept and develop the technological concept of the process. The student can modify existing and design new environmental technologies.		[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools		
	[K6_W03] has a basic knowledge of soil, air and water pollutants, design and supervision of environmentally friendly technologies and technologies which do not produce waste, knows technology of cleaning and neutralization of industrial waste and wastewater management, has a basic understanding of the theoretical basis of methods and types of apparatus used in chemical analysis of environmental pollutants		The student understands the issue of environmental protection (soil, water, air) and its importance when designing technological processes (designing waste-free, environmentally friendly processes)		[SW1] Assessment of factual knowledge		

Subject contents	Chemical technology as an applied science. Genesis of a new technological process. Chemical conception of a method. Technological concept of the method - technological principles (realization of technological principles on the example of selected technological processes). Block flow diagram and process flow diagram. Material and energy balance of a technological process. Experience as a basis for process design - research program, optimization. Issues of kinetics and catalysis of the technological process. Catalytic processes in chemical technology. Selected processes in inorganic industry. Processing of oil and gas. Electrochemical processes. Energy management in chemical industry.		
Prerequisites and co-requisites	Knowledge of chemical and process engineering fundamentals, chemical apparatus, chemical thermodynamics and kinetics, environmental protection.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Test	60.0%	25.0%
	Reports	60.0%	25.0%
	Exam	60.0%	50.0%
Recommended reading	Basic literature	<ol style="list-style-type: none">1. Szarawara J., Piotrowski J., Podstawy teoretyczne technologii chemicznej, WNT Warszawa 2010.2. Bretsznajder S. i in., Podstawy ogólne technologii chemicznej, WNT Warszawa 1973.3. Synoradzki L., Wisiański J. (red.), Projektowanie procesów technologicznych. Od laboratorium do instalacji przemysłowej, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2006.4. Dylewski, R., Projekt technologiczny. Rodzaje opracowań badawczych i badawczo projektowych, przykłady, materiały pomocnicze, WPS Gliwice 1999.5. W. Kordylewski: Spalanie i Paliwa, Politechnika Wrocławska, 1999.6. R. Dylewski, W. Gnot i M. Gonet: Elektrochemia Przemysłowa. Wybrane Procesy i Zagadnienia, Politechnika Śląska, 1999.7. E. Roduner, Understanding catalysis, Chem. Soc. Rev., 2014, 43, 8226-8239.8. Pakowski Zdzisław, Symulacja procesów inżynierii chemicznej: teoria i zadania rozwiązane programem Mathcad, Łódź, Wydaw. Politech. Łódzkiej, 2001r.9. Mieczysław Serwiński, Zasady inżynierii chemicznej i procesowej, WNT, W-wa, 1982r.	
	Supplementary literature	<ol style="list-style-type: none">1. E. Grzywa, J. Molenda, Technologia podstawowych syntez organicznych, WNT, Warszawa, 2008, t.1 i 22. R. Zarzycki, Zaawansowane techniki utleniania w ochronie środowiska, PAN 20023. Klugmann-Radziemska E.: Termodynamika techniczna. Dla studentów technologii chemicznej, WPG, 2008	
	eResources addresses	Adresy na platformie eNauczanie: ZT_Podstawy technologii chemicznej -wykład 2023/2024 - Moodle ID: 30272 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30272 ZT_Podstawy technologii chemicznej -wykład 2023/2024 - Moodle ID: 30272 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30272	
Example issues/ example questions/ tasks being completed	1) Analyze the chemical concept of a process design 2) Analyze the technological concept of a process design 3) Characterize unit operations and processes 4) Create a conceptual and technological diagram 5) Apply technological principles using selected unit operations as an example 6) Calculate the material and heat balance of a technological process.		
Work placement	Not applicable		