



Subject card

Subject name and code	Basis of Chemical Technology, PG_00048786						
Field of study	Green Technologies						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2022/2023		
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			6.0		
Learning profile	general academic profile	Assessment form			exam		
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 inż. Izabela Wysocka 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	15.0	0.0	30.0	15.0	0.0	60
	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	60	10.0		80.0	150	
Subject objectives	To provide students with a knowledge of the chemical technology theory, ability to find chemical technological processes as a set of technical, organizational and economical aspects as well as selected technologies of 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
	Exam	60.0%	50.0%
	Reports	60.0%	25.0%
	Test	60.0%	25.0%
Recommended reading	Basic literature	<ol style="list-style-type: none"> <li>1. Szarawara J., Piotrowski J., Podstawy teoretyczne technologii chemicznej, WNT Warszawa 2010.</li> <li>2. Bretsznajder S. i in., Podstawy ogólne technologii chemicznej, WNT Warszawa 1973.</li> <li>3. Synoradzki L., Wisiański J. (red.), Projektowanie procesów technologicznych. Od laboratorium do instalacji przemysłowej, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2006.</li> <li>4. Dylewski, R., Projekt technologiczny. Rodzaje opracowań badawczych i badawczo projektowych, przykłady, materiały pomocnicze, WPŚ Gliwice 1999.</li> <li>5. W. Kordylewski: Spalanie i Paliwa, Politechnika Wroclawska, 1999.</li> <li>6. R. Dylewski, W. Gnot i M. Gonet: Elektrochemia Przemysłowa. Wybrane Procesy i Zagadnienia, Politechnika Śląska, 1999.</li> <li>7. E. Roduner, Understanding catalysis, Chem. Soc. Rev., 2014, 43, 8226-8239.</li> <li>8. Pakowski Zdzisław, Symulacja procesów inżynierii chemicznej: teoria i zadania rozwiązane programem Mathcad, Łódź, Wydaw. Politech. Łódzkiej, 2001r.</li> <li>9. Mieczysław Serwiński, Zasady inżynierii chemicznej i procesowej, WNT, W-wa, 1982r.</li> </ol>	
	Supplementary literature	<ol style="list-style-type: none"> <li>1. E. Grzywa, J. Molenda, Technologia podstawowych syntez organicznych, WNT, Warszawa, 2008, t.1 i 2</li> <li>2. R. Zarzycki, Zaawansowane techniki utleniania w ochronie środowiska, PAN 2002</li> <li>3. Klugmann-Radziemska E.: Termodynamika techniczna. Dla studentów technologii chemicznej, WPG, 2008</li> </ol>	
	eResources addresses	Adresy na platformie eNauczanie:	
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. 7) apply Sabatier's rule.		
Work placement	Not applicable		