GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Basis of chemical technology, PG_00057678		
Field of study	Green Technologies		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2024/2025
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		

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_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
[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.	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment

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.

<table>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Exam</td><td>60.0%</td><td>50.0%</td></tr>
<tr><td>Reports</td><td>60.0%</td><td>25.0%</td></tr>
<tr><td>Test</td><td>60.0%</td><td>25.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>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., Wisialski 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, WPŚ 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, Łódz, Wydaw. Politech. Łódzkiej, 2001r.
9. Mieczysław Serwiński, Zasady inżynierii chemicznej i procesowej, WNT, W-wa, 1982r.</td></tr>
<tr><td>Supplementary literature</td><td>1. E. Grzywa, J. Molenda, Technologia podstawowych syntez organicznych, WNT, Warszawa, 2008, t.1 i 2 2. R.Zarzycki, Zaawansowane techniki utleniania w ochronie środowiska, PAN 2002 3. Klugmann-Radziemska E.: Termodynamika techniczna. Dla studentów technologii chemicznej, WPG, 2008</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">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.</td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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