GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Basic of Chemical Technology, PG_00049398		
Field of study	PODSTAWY TECHNOLOGII CHEMICZNEJ		
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	5.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Process Engineering and Chemical Technology -> Faculty of Chemistry -> Wydziały Politechniki Gdańskiej		
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 dr inż. Natalia Łukasik	

Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	15.0	0.0	15.0	60
	E-learning hours included: 0.0						
	eNauczanie source address: https://enauczanie.pg.edu.pl/moodle/course/view.php?id=38286 Moodle ID: 1833 PODSTAWY TECHNOLOGII CHEMICZNEJ - seminarium https://enauczanie.pg.edu.pl/2025/course/view.php?id=1833						

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	5.0	60.0	125

Subject objectives	To gain knowledge of the practical application of engineering science and technology, the application of principles, techniques and procedures to the design and production of various chemical products. The aim is also for the Student to gain the ability to see technological processes as a set of technical, organisational and economic issues and to become familiar with selected processes of the chemical industry.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U06] can analyze the functioning of equipment, apparatus and technology lines used in laboratories and chemical industry, and can recognize and propose methods to solve the simple engineering tasks which he can meet as an Engineer and select and use routine methods, chemical apparatus and tools to solve practical engineering tasks, including also technological processes; can himself/herself read and make technical drawings using CAD software	The student is familiar with the basic apparatus and equipment used in laboratories and chemical industry plants and how they work. The student is able to perform the calculations necessary to prepare the energy and material balance of a technological process. The student is able to draw and read basic diagrams used in process design. Students have basic knowledge enabling them to design and analyze chemical processes.	[SU2] Ocena umiejętności analizy informacji [SU3] Ocena umiejętności wykorzystania wiedzy uzyskanej w ramach przedmiotu [SU1] Ocena realizacji zadania [SU4] Ocena umiejętności korzystania z metod i narzędzi
[K6_K05] can identify the dilemmas (also ethical) associated with the practising of chemical engineer profession	Student understands the technical, organisational and ethical problems associated with the the profession of chemical engineerin	[SK4] Ocena umiejętności komunikacji, w tym poprawności językowej
[K6_W05] knows and understands the chemical processes and algorithms of mathematical models which are necessary for the design of technological processes, knows chemical structure of contemporary materials and its relation to their properties, enabling the selection of the materials for sustainable development technology and material-efficient and energy-efficient methods	Student is able to select a chemical concept and develop a technological process concept. The student understands the problem of optimisation of a chemical process.	[SW1] Ocena wiedzy faktograficznej

Subject contents

Chemical technology as an applied science. Genesis of a new technological process. Chemical concept of a method. Technological concept of the method - technological principles (implementation of technological principles on the example of selected technological processes). Block diagram, piping and instrumentation diagram, material and energy balance of a technological process. Experience as a basis for process design - research programme, optimisation. Issues of kinetics and catalysis of a technological process. Catalytic processes in chemical technology. Selected processes in the inorganic industry. Oil and gas processing. Electrochemical processes. Energy management in the chemical industry.

Prerequisites and co-requisites

Knowledge of the fundamentals of chemical and process engineering, chemical apparatus, chemical thermodynamics and kinetics, environmental protection

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
colloquium	60.0%	25.0%
exam	60.0%	50.0%
reports	60.0%	25.0%

Recommended reading	Basic literature	1. Szarawara J., Piotrowski J., Podstawy teoretyczne technologii chemicznej, WNT Warszawa 2010. 2. Bretsznajder S. i in., Podstawy ogolne technologii chemicznej, WNT Warszawa 1973. 3. Synoradzki L., Wisialski J. (red.), Projektowanie procesow technologicznych. Od laboratorium do instalacji przemysłowej, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2006. 4. Dylewski, R., Projekt technologiczny. Rodzaje opracowan 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 Slaska, 1999. 7. E. Roduner, Understanding catalysis, Chem. Soc. Rev., 2014, 43, 8226-8239. 8. Pakowski Zdzisław, Symulacja procesów inżynierii chemicznej: teoria i zadania rozwiazane programem Mathcad, Łodz, Wydaw. Politech. Łodzkiej, 2001r. 9. Mieczysław Serwinski, Zasady inzynierii chemicznej i procesowej, WNT, W-wa, 1982
	Supplementary literature	1. Schmidt-Szałowski K. i in., Technologia chemiczna. Przemysł nieorganiczny, PWN, 2013. 2. H. L. White: Introduction to Industrial Chemistry, Wiley, 1987. 3. J. N. Armor, A history of industrial catalysis, Catalysis Today, 2011, 163, 3-9. 4. Roman Koch, Antoni Kozioł, Dyfuzyjno-cieplny rozdział substancji, WNT, W-wa, 1994r. 5. Roman Zarzycki, Andrzej Zhacuk, Absorpcja i absorbery, WNT, Wwa, 1995r. 6. Said S. E. M. Elnashaie, Parag Garhyan , CONSERVATION EQUATIONS AND MODELING OF CHEMICAL AND BIOCHEMICAL PROCESSES,ISBN: 0-8247-0957-8, Marcel Dekker AG Hutgasse 4, Postfach 812, CH-4001 Basel
	eResources addresses	Basic https://katalogbpg.pg.edu.pl/discovery/dbsearch?vid=48FAR_PGD:48PGD&lang=pl - Databases provided by the Gdańsk Tech Library Supplementary https://enauczanie.pg.edu.pl/moodle/course/view.php?id=38287 - eNauczanie platform https://katalogbpg.pg.edu.pl/discovery/dbsearch?vid=48FAR_PGD:48PGD&lang=pl - Databases provided by the Gdańsk Tech Library

Example issues/ example questions/ tasks being completed	1.Describe the components of a chemical process design concept. 2.Interpreting the principle of best use of energy, describe the methods of heat recovery used in the production processes of the chemical industry. 3.State the principles of creating an block diagram. 4.Give an example of the application of technological principles on the example of a selected unit process or operation. 5.Calculate the material balance of the given unit process or operation. 6.Calculate the heat balance of the given unit process or operation. 7.Describe 2 examples of electrode processes in which the electrode material is chemically converted. 8.For what purpose is the hydrocracking process carried out in crude oil processing? What process yields hydrogen used in hydrocracking in the refining industry?
Practical activites within the subject	Not applicable

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