



## Subject card

Subject name and code	, PG_00048766						
Field of study	Green Technologies						
Date of commencement of studies	October 2021	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	3	Language of instruction			English		
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. Marek Lieder					
	Teachers	dr hab. inż. Marek Lieder dr hab. inż. Justyna Łuczak					
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 Address on the e-learning platform: <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=6136">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=6136</a>						
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	Learning of theoretical and practical aspects of the green chemical technologies. Acquiring the ability to combine theoretical knowledge with technological expectations.						
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	Students will acquire knowledge in accordance with [9411] [K6_U02]			[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment		
	[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	Students will acquire knowledge in accordance with [9488] [K6_W03]			[SW1] Assessment of factual knowledge		

Subject contents	1. Physico-chemical principles of technological processes  2. Chemical and technological conception of a method  3. The best use of raw materials  4. Principle of the best use of energy  5. Elements of electrochemical technology  6. Energy management in industry. Combustion  7. Simulations of chemical processes  8. Energy and mass balance											
Prerequisites and co-requisites	Student has basic knowledge of general, inorganic, organic and physical chemistry.											
Assessment methods and criteria	<table border="1" data-bbox="448 781 1487 887"> <thead> <tr> <th data-bbox="448 781 794 815">Subject passing criteria</th> <th data-bbox="794 781 1141 815">Passing threshold</th> <th data-bbox="1141 781 1487 815">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 815 794 848">Exam</td> <td data-bbox="794 815 1141 848">60.0%</td> <td data-bbox="1141 815 1487 848">60.0%</td> </tr> <tr> <td data-bbox="448 848 794 887">Lab repors</td> <td data-bbox="794 848 1141 887">0.0%</td> <td data-bbox="1141 848 1487 887">40.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Exam	60.0%	60.0%	Lab repors	0.0%	40.0%
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Exam	60.0%	60.0%										
Lab repors	0.0%	40.0%										
Recommended reading	Basic literature	1. Jess, A., Wasserscheid, P., Chemical Technology: An Integral Textbook, Wiley, 2013  2. Kirk, R.E., Encyclopedia of Chemical Technology, Wiley & Sons Inc., 2007  3. Moulijn, J.A., Makkee, M., Diepen, A.E., Chemical Process Technology, 2014  4. Koyikkal, S., Chemical Process Technology and Simulation, PHI learning, 2013  5. H. L. White: Introduction to Industrial Chemistry, Wiley, 1987										
	Supplementary literature	not applicable										
	eResources addresses	Adresy na platformie eNauczanie: Basis of Chemical Technology - Lab - 2022/2023 - Nowy - Moodle ID: 29068 <a href="https://enauzanie.pg.edu.pl/moodle/course/view.php?id=29068">https://enauzanie.pg.edu.pl/moodle/course/view.php?id=29068</a> Basis of Chemical Technology - Lab - 2022/2023 - Nowy - Moodle ID: 29068 <a href="https://enauzanie.pg.edu.pl/moodle/course/view.php?id=29068">https://enauzanie.pg.edu.pl/moodle/course/view.php?id=29068</a> Basis of Chemical Technology - Lab - 2022/2023 - Nowy - Moodle ID: 29068 <a href="https://enauzanie.pg.edu.pl/moodle/course/view.php?id=29068">https://enauzanie.pg.edu.pl/moodle/course/view.php?id=29068</a>										
Example issues/ example questions/ tasks being completed	1. Define the following terms: unit operations, and unit processes. Support definition with technological examples. 2. What does it mean to 'freeze' a chemical system? 3. Describe parallel heat exchange. 4. Describe the Sabatier's rule (energy profiles are necessary). 5. Describe the shift conversion.											
Work placement	Not applicable											