



Subject card

Subject name and code	, PG_00057784						
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			English		
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. Marek Lieder				
	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	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_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		Student understands that chemical technology is an applied, interdisciplinary science, which propose conditions and technological schemes for obtaining the desired chemical products in an optimal, environmentally friendly manner, taking into account the appropriate scale of production and acceptable costs.		[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		Student knows and understands physico-chemical basis of chemical technologies. Understands the importance of fundamental operation and process units.		[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject		
Subject contents	Chemical technology as applied science Genesis of the new technological process Physico-chemical principles of technological processes Chemical and technological conception of a method The best use of raw materials Principle of the best use of energy Energy management in industry. Combustion Catalysis in industrial chemistry Elements of electrochemical technology Simulations of chemical processes Material and energy balance						

Prerequisites and co-requisites	Student has basic knowledge of general, inorganic, organic and physical chemistry.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Lecture - Examination	60.0%	60.0%
	Lab - reports	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:	
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		