



Subject card

Subject name and code	, PG_00057784						
Field of study	Green Technologies						
Date of commencement of studies	October 2024	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	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 -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Marek Lieder				
	Teachers		dr hab. inż. Marek Lieder				
Lesson types	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						
eNauczanie source address: https://enauczanie.pg.edu.pl/moodle/course/view.php?id=6136							
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	The student has systematic knowledge of chemical technology as an interdisciplinary applied science, covering the design and optimization of technological processes leading to the production of chemical products, taking into account environmental aspects, appropriate production scale, and economic efficiency.			[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 operate specialized measuring and analytical equipment, perform physicochemical and instrumental determinations in accordance with applicable standards and procedures, as well as design and select simple technological systems and devices in accordance with design assumptions and specified technical specifications.			[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task			

Subject contents	Course content – lecture 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		
	Course content – laboratory 1. Unit processes and unit operations infatty acids methyl esters production 2. Experimental factorial design 3. Selected aspects from the sulfur and phosphorus compounds technology: Superphosphate preparation 4. Selected aspects of the sulfur and phosphorus technologies: catalytic oxidation of SO ₂ . 5. Selected aspects of the sulfur and phosphorus technologies flue gas desulfurization 6. Hydrogen production by water elektrolysis.		
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
	Lab repors	0.0%	40.0%
	Exam	60.0%	60.0%
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		

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.
Practical activities within the subject	Not applicable

Document generated electronically. Does not require a seal or signature.