



Subject card

Subject name and code	Green organic technologies, PG_00057602						
Field of study	Zielone technologie organiczne						
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	6		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Chemistry and Technology of Functional Materials -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Anna Schmidt				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	0.0	0.0	30
	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	30		2.0		18.0	50
Subject objectives	1. To acquaint students with the principles of green technology design. 2. To acquaint students with examples of processes that meet the principles of sustainable development. 3. Learning about examples of processes based on renewable raw materials. 4. Comparison of the production processes of the same product from renewable and non-renewable raw materials.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_K06] has awareness of the importance of non-technical aspects and effects of engineering activities, including its impact on the environment and the associated responsibility for decisions.		The student understands the impact of the actions taken on the environment and recognizes their environmental, economic and legal aspects.		[SK5] Ocena umiejętności rozwiązywania problemów występujących w praktyce [SK4] Ocena umiejętności komunikacji, w tym poprawności językowej [SK1] Ocena umiejętności pracy w grupie		
	[K6_W02] has a basic knowledge of chemistry including general chemistry, inorganic, organic, physical, analytical, including the knowledge necessary to describe and understand the phenomena and chemical processes occurring in the environment; measurement and the determination of the parameters of these processes.		The student has the knowledge to understand the processes carried out in organic technology. He/she can propose changes leading to reduction of emissions and waste.		[SW3] Ocena wiedzy zawartej w opracowaniu tekstowym i projektowym [SW2] Ocena wiedzy zawartej w prezentacji [SW1] Ocena wiedzy faktograficznej		
	[K6_W04] is aware of the importance of environmental protection and has a basic knowledge of chemical and biological threats to the environment, with particular emphasis on anthropogenic factors, has a basic knowledge of knowledge of the principles of sustainable development as well as national and European environmental management conditions.		The student has knowledge of the role and importance of the environment and sustainable development. The student can define the risks associated with the chemical industry.		[SW3] Ocena wiedzy zawartej w opracowaniu tekstowym i projektowym [SW1] Ocena wiedzy faktograficznej [SW2] Ocena wiedzy zawartej w prezentacji		

Subject contents	Course content – lecture Introduction to green chemistry. The Twelve Principles of Green Chemistry. Innovative aspects of green chemistry. Green organic reactions "on water" and in superheated water. Green "solvent free" organic reactions. Introduction to sustainable development. Examples of green technologies in heavy organic technology. Examples of green technologies in the pharmaceutical industry. Examples of green technologies in the production of polymers. Green detergents and plant protection products. Green polymers and dyes. Green organic catalysts. Other modern technologies based on renewable raw materials. Comparison of the production processes of hydrogen, alkenes and fuels from biomass with similar processes using methane. Organic adsorbents used in water treatment.											
Prerequisites and co-requisites	Knowledge of industrial analytical techniques. Knowledge of organic chemistry . Knowledge of basic techniques of water, air and soil protection . Basic knowledge of technology and chemical engineering . knowledge of green inorganic technologies.											
Assessment methods and criteria	<table><tr><td>Subject passing criteria</td><td>Passing threshold</td><td>Percentage of the final grade</td></tr><tr><td>Active participation in discussions during lectures</td><td>60.0%</td><td>50.0%</td></tr><tr><td>Solving tasks related to green organic technologies.</td><td>60.0%</td><td>50.0%</td></tr></table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Active participation in discussions during lectures	60.0%	50.0%	Solving tasks related to green organic technologies.	60.0%	50.0%
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Example issues/ example questions/ tasks being completed	1. Based on the calculated environmental parameters, make the right choice of raw materials for the process. 2. Discuss examples of technologies implemented in solvent-free conditions. 3. What are the limitations of these methods? 4. Environmental problems resulting from the use of biomass in the production of hydrogen. 5. Environmental problems in the production of natural dyes and detergents. Is bioethanol dehydration an example of green technology? 6. Is propene production from waste glycerin obtained during biodiesel production really a green technology?											
Practical activities within the subject	Not applicable											

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