

**Subject card**

<b>Subject name and code</b>	Green Technologies, PG_00053461						
<b>Field of study</b>	Business and Environmental Technology						
<b>Date of commencement of studies</b>	October 2024	<b>Academic year of realisation of subject</b>				2024/2025	
<b>Education level</b>	Master's studies	<b>Subject group</b>					
<b>Mode of study</b>	full-time studies	<b>Mode of delivery</b>				at the university	
<b>Year of study</b>	1	<b>Language of instruction</b>				Polish	
<b>Semester of study</b>	1	<b>ECTS credits</b>				2.0	
<b>Learning profile</b>	academic	<b>Assessment form</b>				credit	
<b>Conducting unit</b>	Laboratory of Catalytic Materials and Processes -> Department of Environmental Technology -> Faculty of Chemistry -> Rector						
<b>Name and surname of lecturer (lecturers)</b>	<b>Subject supervisor</b>		dr Joanna Drzeżdżon				
	<b>Teachers</b>		dr Joanna Drzeżdżon				
<b>Lesson types</b>	<b>Lesson type</b>	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	<b>Number of study hours</b>	0.0	30.0	0.0	0.0	0.0	30
	E-learning hours included: 0.0						
<b>Learning activity and number of study hours</b>	<b>Learning activity</b>	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	<b>Number of study hours</b>	30		0.0		0.0	30
<b>Subject objectives</b>	To familiarize students with the principles of green chemistry and technology. To acquire oral presentation skills.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[BiTEMU2_U08] searches, selects and analyzes the literature on environmental sciences, including scientific journals and databases, reading and understanding scientific texts in the native language and English	He independently searches for information in the literature.	[SU2] presentation/project/paper/report
	[BiTEMU2_K02] understands the need to cooperate and work in a group, assuming responsible roles within it	He takes responsibility for the work of the whole team and also knows how to perform different roles in the group when solving research problems and conducting experiments.	[SK2] presentation/project/paper/report
	[BiTEMU2_U07] proposes processes and methods of water treatment, sewage and waste gas treatment, environmental remediation, and waste management used in environmental protection	Lists examples of green technologies in the chemical industry, food industry and environmental protection.	[SU2] presentation/project/paper/report
	[BiTEMU2_K03] understands the need to properly set priorities, plan and organize tasks related to their implementation, as well as monitor and evaluate progress	Maintains openness to suggestions from the instructor and fellow group members. Takes responsibility for the work of the whole team and also knows how to perform different roles in the group when solving research problems and conducting experiments.	[SK2] presentation/project/paper/report
	[BiTEMU2_W09] predicts the effects of human interference in the natural environment and analyzes the impact of human activity on the quality of the environment on a local, regional and global scale at an advanced level	He is aware of the dangers of environmental degradation and the need for changes in technology.	[SW2] presentation/project/paper/report
	[BiTEMU2_U05] is able to give a presentation and independently prepare various specialized written works appropriate for the field studied or in the area on the border of various scientific disciplines, using basic theoretical approaches, collecting various sources of data, their description and interpretation, and drawing conclusions based on scientific literature and the results of own research work	Prepares and delivers a presentation. Evaluates selected technology in the context of its cost-effectiveness and invasiveness for humans and the environment.	[SU2] presentation/project/paper/report
	[BiTEMU2_K07] demonstrates responsibility for the safety of one's own work and that of others, taking into account the risks resulting from the research techniques used, and creates conditions for safe work in the laboratory or in the field	He takes responsibility for the work of the whole team and also knows how to perform different roles in the group when solving research problems and conducting experiments.	[SK2] presentation/project/paper/report
	[BiTEMU2_U06] uses advanced methods, techniques, and tools to assess the quality of the environment and the effectiveness of the technological processes used	Evaluates selected technology in the context of its cost-effectiveness and invasiveness for humans and the environment.	[SU2] presentation/project/paper/report
	[BiTEMU2_W01] describes the relationship between economics and ecological technology, their place in the system of social and exact sciences at an advanced level	Lists examples of green technologies in the chemical, food industry and environmental protection.	[SW2] presentation/project/paper/report
	[BiTEMU2_W10] explains the mechanisms of unit processes used in remediation and environmental protection as well as waste management methods at an advanced level	In a comprehensible manner, both in speech and writing, presents correct technological reasoning.	[SW2] presentation/project/paper/report

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Subject contents	Principles of green chemistry and principles of green technology. Examples of eco-investments in the chemical and food industries, technologies for industrial waste management, hazardous waste management and carbon storage. Life cycle analysis of a product taking into account the principles of sustainable development and the principles of green chemistry. Evaluating the environmental impact of a product throughout its life cycle, from raw material extraction, production, distribution, use and disposal. Consideration of both the principle of minimizing negative environmental impact and the principles of green chemistry, which promote greener chemical methods.									
Prerequisites and co-requisites	Fundamentals of general chemistry.									
Assessment methods and criteria	<table border="1"> <thead> <tr> <th>Subject passing criteria</th> <th>Passing threshold</th> <th>Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td>execution and presentation of a credit work - a multimedia presentation</td> <td>51.0%</td> <td>100.0%</td> </tr> </tbody> </table>	Subject passing criteria	Passing threshold	Percentage of the final grade	execution and presentation of a credit work - a multimedia presentation	51.0%	100.0%			
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Example issues/ example questions/ tasks being completed	List the principles of green chemistry. Describe process improvements to a selected product for compliance with green chemistry principles. Describe the importance of recycling in the life cycle of a product.									
Work placement	Not applicable									

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