

**Subject card**

Subject name and code	Green technology, PG_00121252						
Field of study	Chemical Business, Chemistry						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2025/2026		
Education level	Master's studies	Subject group			Optional subject group		
Mode of study	full-time studies	Mode of delivery			at the university		
Year of study	2	Language of instruction			Polish		
Semester of study	3	ECTS credits			1.0		
Learning profile	academic	Assessment form			credit		
Conducting unit	Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. Ewa Siedlecka				
	Teachers		prof. dr hab. Ewa Siedlecka				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	15.0	0.0	0.0	0.0	15
	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	15		2.0		8.0	25
Subject objectives	to familiarize students with the principles of green technology, sustainable development and chemical safety						
Learning outcomes	Course outcome	Subject outcome		Method of verification			
	[CHEMMU2_W05] Has extended knowledge in the field of the specialisation studied.	is able to use basic terminology in the field of green technologies and green syntheses		[SW1] oral statement/ conversation/discussion [SW2] presentation/project/paper/report			
	[CHEMMU2_K01] Knows the limitations of her/his own knowledge; understands the need for further education and can inspire other people to do so.	is aware of the threats resulting from the degradation of the natural environment and the need for changes in technology and chemical synthesis		[SK1] oral statement/conversation/discussion [SK2] presentation/project/paper/report			
	[CHEMMU2_W11] Demonstrates general knowledge about the current trends in the development of chemistry as a science and the latest discoveries in this field.	lists and discusses examples of green chemical syntheses and methods of obtaining green energy		[SW1] oral statement/ conversation/discussion [SW2] presentation/project/paper/report			
Subject contents	Philosophy of green chemistry, principles of green technology. The concept of sustainable development. Creating chemical processes and products that do not harm the environment. Green plastics and technologies for their production. Advanced catalytic processes. Use of sunlight in synthesis processes. Alternative reagents and reaction media. Waste biomass as a substrate in organic synthesis. Ionic liquids and fluorinated compounds as modern solvents and reagents. Application of biphasic systems and intelligent solvents. Reactions occur without the participation of solvents. New methods of conducting reactions. Electrochemical reactions - application of new electrode materials. Fuel and microbiological cells. Photochemical reactions. Syntheses assisted by microwave radiation. Reactions assisted by acoustic waves. Examples of eco-innovations in the plastics, cosmetics and pharmaceutical, food industries. Technologies for the management of industrial and hazardous waste. The laboratories will consist of exercises related to selected topics covered during lectures.						
Prerequisites and co-requisites	basics of general chemistry						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	grade for activity during classes	51.0%	30.0%
	assessment for performing assigned tasks	51.0%	70.0%
Recommended reading	Basic literature	literature provided by the instructor during classes	
	Supplementary literature	literature independently found by the student under the guidance of a teacher	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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