

Subject card

Subject name and code	Prototyping and Elements of Technology Design, PG_00199741						
Field of study	Business and Environmental Technology						
Date of commencement of studies	October 2026	Academic year of realisation of subject			2027/2028		
Education level	Master's 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	3	ECTS credits			6.0		
Learning profile	academic	Assessment form			credit		
Conducting unit	Laboratory of Photocatalysis -> Department of Environmental Technology -> Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Joanna Nadolna				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	15.0	30.0	45.0	0.0	90
	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	90		0.0		60.0	150
Subject objectives	<ul style="list-style-type: none"> Familiarizing students with intellectual property issues Introducing students to the process of writing a patent application, including patent claims Acquainting students with the concept of design thinking Teaching students how to present their own ideas Familiarizing students with elements of technology design 						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[BiTEMU2_W07] lists and describes the concepts and principles of protection of industrial property and copyright, the need to manage intellectual property resources and the principles of using patent information resources	The student has knowledge of key terms and rules regarding the protection of inventions, trademarks, industrial designs, and works protected by copyright. The student is also able to use patent databases.	[SW2] 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	The student is able to propose purification processes for water, wastewater, and gases for the proposed technology for obtaining a selected product.	[SU2] presentation/project/paper/report
	[BiTEMU2_W11] has an in-depth understanding of and applies safety and hygiene rules when working independently at a research or measurement station in the laboratory or in the field at an advanced level	The student knows all rules regarding safety and hygiene at work to ensure a safe and efficient working environment for themselves and others.	[SW1] oral statement/conversation/discussion
	[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	The student adheres to safety regulations, applies appropriate personal protective measures, and ensures that the work environment is safe for everyone present.	[SK8] observation of student's independent or team work
	[BiTEMU2_W01] provides an in-depth analysis of the relationship between economics and environmental technology, and their place within the social and natural sciences.	The student is able to analyze how economics influences the development and implementation of ecological technologies, and how these technologies impact the economy and society.	[SW2] 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	Demonstrates responsibility for the timely completion of tasks.	[SK2] presentation/project/paper/report
	[BiTEMU2_W02] distinguishes legal and administrative mechanisms and procedures in environmental protection and interprets it in depth manner	The student knows and understands national and international laws, regulations, and procedures related to environmental protection.	[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 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	The student can give a presentation on a topic related to the developed chemical technology. The student is able to independently prepare a project concerning the production process of a selected product. The student can describe and interpret data sources and the results of their own research.	[SU2] presentation/project/paper/report
	[BiTEMU2_K02] understands the need to cooperate and work in a group, assuming responsible roles within it	The student is capable of communicating, collaborating, and taking action within a group to achieve common goals. They can fulfill various roles depending on the team's needs, while maintaining responsibility for their tasks and supporting other group members.	[SK8] observation of student's independent or team work
	[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	The student is able to use scientific and patent databases available in both Polish and English languages.	[SU2] presentation/project/paper/report
	[BiTEMU2_U09] plans and performs research tasks in the field or laboratory and interprets research results on environmental protection issues	The student plans to obtain and attempts to obtain the designed product on a laboratory scale. The student describes and interprets the obtained research results.	[SU2] presentation/project/paper/report

Subject contents	<ul style="list-style-type: none"> Patents and licenses (preparation of patent claims, patent search, patentability, application preparation in Poland and worldwide) Design thinking Prototyping and creative problem solving Teamwork, team management Elements of technology design (selection of chemical and technological concepts) Technology readiness assessment Presenting ideas 		
Prerequisites and co-requisites	Basic knowledge of English language.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	project	51.0%	100.0%
Recommended reading	Basic literature	A1. Used during classes: Unpublished materials provided to students during classes. A2. Studied independently by the student: Patent descriptions of selected technologies and scientific publications. Materials will be sourced from online patent and publication databases.	
	Supplementary literature	no	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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