

Subject card

Subject name and code	Advanced Technologies of Environmental Remediation, PG_00081028						
Field of study	Business and Environmental Technology						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2024/2025		
Education level	Master's studies	Subject group					
Mode of study	full-time studies	Mode of delivery			at the university		
Year of study	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			2.0		
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 hab. inż. Ewelina Grabowska-Musiał				
	Teachers		dr hab. inż. Ewelina Grabowska-Musiał				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	23.0	0.0	0.0	23
	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	23		0.0		0.0	23
Subject objectives	<p>familiarizing students with the classification and sources of pollution of individual elements of the ecosystem</p> <p>familiarization with selected soil remediation technologies</p> <p>familiarizing students with modern oxidation processes used in environmental remediation</p> <p>developing the ability to conduct experiments independently</p> <p>ability to apply the methodology given in the manual and interpret the obtained results</p> <p>ability to present results in writing</p>						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[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	based on acquired knowledge and operates multimedia programs, prepares and delivers an oral presentation	[SU2] 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	appropriately selects the research methods learned, adapting them to specific environmental conditions	[SU1] oral statement/conversation/discussion [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	plans and coordinates independently experimental work carried out	[SK8] observation of student's independent or team work
	[BiTEMU2_W01] describes the relationship between economics and ecological technology, their place in the system of social and exact sciences at an advanced level	can describe independently existing problems regarding impact of environmental degradation on economic aspects	[SW4] test/exam - oral or written [SW1] oral statement/conversation/discussion [SW5] implementation of a problem task
	[BiTEMU2_U09] plans and performs research tasks in the field or laboratory and interprets research results on environmental protection issues	plans independently research experiments i prepares the interpretation of the results	[SU1] oral statement/conversation/discussion [SU5] implementation of a problem task [SU6] demonstration of practical skills [SU8] observation of student's independent or team work
	[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	based on the latest literature and topics of classes independently discusses issues regarding environmental degradation	[SW4] test/exam - oral or written [SW1] oral statement/conversation/discussion [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	distinguishes and discusses the basic ones processes used in engineering environment	[SW4] test/exam - oral or written [SW1] oral statement/conversation/discussion
	[BiTEMU2_W11] 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	applies safety rules in the workplace	[SW1] oral statement/conversation/discussion [SW5] implementation of a problem task
	[BiTEMU2_K02] understands the need to cooperate and work in a group, assuming responsible roles within it	can do it alone and together with solve given problems in a group	[SK1] oral statement/conversation/discussion [SK6] demonstration of practical skills [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	can independently search and interpret literature from the best scientific databases	[SU2] presentation/project/paper/report [SU8] observation of student's independent or team work
	[BiTEMU2_U06] uses advanced methods, techniques, and tools to assess the quality of the environment and the effectiveness of the technological processes used	can choose the appropriate ones methods of checking effectiveness processes used water, soil or. purification air	[SU1] oral statement/conversation/discussion [SU6] demonstration of practical skills [SU8] observation of student's independent or team work

	Course outcome	Subject outcome	Method of verification
	[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	based on regulations occupational safety learned controls them during their studies compliance on site work	[SK8] observation of student's independent or team work
Subject contents	carrying out exercises thematically related to the purification of soil, sewage, leachate and air (technological and qualitative aspects)		
Prerequisites and co-requisites	Basics of general chemistry		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	laboratory classes	51.0%	100.0%
Recommended reading	Basic literature	Grabowska-Musiał Ewelina. unpublished materials, made available to students during classes	
		Zadroga B., Olańczuk-Neyman K., Ochrona i rekultywacja podłoża gruntowego, Wydawnictwo Politechniki Gdańskiej 2001. Surygała J. (Red.) Zanieczyszczenia naftowe w gruncie, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2000 Gworek B., Barański A., Kondzielski I., Kucharski R., Sas-Nowosielska A., Małkowski E., Nogaj K., Rzychoń D., Worsztynowicz A., Technologierekultywacji gleb. Monografia IOR, Warszawa 2004 Lewandowski W., Techniczno-technologiczne i aparaturowe aspekty ochrony powietrza, WPG Gdańsk 2011.	
	Supplementary literature	brak	
	eResources addresses		
Example issues/ example questions/ tasks being completed	brak		
Work placement	Not applicable		

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