

**Subject card**

<b>Subject name and code</b>	Water and Wastewater Management in Companies, PG_00053456						
<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>							
<b>Name and surname of lecturer (lecturers)</b>	<b>Subject supervisor</b>		dr hab. inż. Ewelina Grabowska-Musiał				
	<b>Teachers</b>		dr hab. inż. Ewelina Grabowska-Musiał				
<b>Lesson types</b>	<b>Lesson type</b>	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	<b>Number of study hours</b>	0.0	0.0	15.0	0.0	0.0	15
	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>	15		0.0		0.0	15
<b>Subject objectives</b>	The aim of the course is to familiarize students with the issues of water and sewage management, in particular including water and industrial wastewater. Defining water and sewage management and its importance for the environment and industry.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[BiTEMU2_U06] uses advanced methods, techniques, and tools to assess the quality of the environment and the effectiveness of the technological processes used	is able to select appropriate methods to check the effectiveness of the applied water, soil or air purification processes	[SU1] oral statement/conversation/discussion [SU8] observation of student's independent or team work
	[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	on the basis of occupational safety regulations learned during studies, controls their compliance at the workplace	[SK8] observation of student's independent or team work
	[BiTEMU2_W02] distinguishes legal and administrative mechanisms and procedures in environmental protection and interprets its international dimension at an advanced level	based on the acquired knowledge, finds a correlation between environmental protection and its connections with applicable law	[SW1] oral statement/conversation/discussion
	[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 operating 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	depending on your needs and problems I propose appropriate processes used in environmental remediation	[SU1] oral statement/conversation/discussion [SU6] demonstration of practical skills [SU8] observation of student's independent or team work
	[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_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_U09] plans and performs research tasks in the field or laboratory and interprets research results on environmental protection issues	independently plans research experiments and interprets 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_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 in the world	[SU2] presentation/project/paper/report [SU8] observation of student's independent or team work

	Course outcome	Subject outcome	Method of verification
	[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	[SK6] demonstration of practical skills [SK8] observation of student's independent or team work
Subject contents	Examples of technological processes used in environmental engineering. Carrying out exercises simulating the course of selected processes used for wastewater treatment.		
Prerequisites and co-requisites	knowledge of basic methods and equipment for water treatment, sewage treatment, basic laboratory work and chemical analysis, ability to independently experiment and solve problems		
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 Kowal A. L., Świdorska-Bróż M., Oczyszczanie wody, Wydawnictwo Naukowe PWN, Warszawa 2007 Bortkiewicz B., 2002. Oczyszczanie ścieków przemysłowych. PWN, Warszawa Hermanowicz W. i inni, Fizyczno-chemiczne badanie wody i ścieków, Wydawnictwo ARKADY, Warszawa 1999 Dymaczewski Z, Oleszkiewicz J.A., Sozański M.M., Poradnik eksploatatora oczyszczalni ścieków, PZliTS, Poznań 1997 Kowal A., Technologia wody, Arkady, W-wa, 1995	
	Supplementary literature	brak	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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