



Subject card

Subject name and code	PROTECTION OF ENVIRONMENTAL, PG_00047994						
Field of study	Environmental Engineering						
Date of commencement of studies	October 2021		Academic year of realisation of subject		2023/2024		
Education level	first-cycle studies		Subject group		Optional subject group Subject group related to scientific research in the field of study		
Mode of study	Part-time studies		Mode of delivery		at the university		
Year of study	3		Language of instruction		Polish		
Semester of study	5		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Environmental Engineering Technology -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. inż. Magdalena Gajewska				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	10.0	5.0	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		4.0		35.0	54
Subject objectives	Understanding the principles of water management and its protection, the impact and cause-and-effect relationships of anthropogenic activities, as well as technologies for reducing pollution and rehabilitation.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W04] possesses elementary knowledge in the field of land mechanics, ground science, land reclamation and geotechnics; has basic knowledge about the composition of air, water and soil, environmental pollution and processes responsible for their formation and ways to reduce them, knows the principles and organization of sustainable water management		The person has a basic knowledge of the composition of air, water, and soil, environmental pollution, and the processes responsible for their formation, as well as methods of limiting them. They understand the principles and organization of sustainable water resource management.		[SW3] Assessment of knowledge contained in written work and projects		
	[K6_W14] has a structured knowledge of current legal regulations regarding environmental protection, water and construction law; knows the basics of public procurement law, patent law, intellectual property protection and labor protection		They have organized knowledge in the field of current legal regulations regarding environmental protection, water law, construction law, and are familiar with the basics of public procurement law, patent law, intellectual property protection, and labor protection.		[SW3] Assessment of knowledge contained in written work and projects		
	[K6_U01] has the ability to self-education, can obtain information from literature, databases and other sources, uses information technology, Internet resources; can integrate the obtained information, make their interpretation, as well as draw conclusions and formulate and justify opinions		They have the ability for self-education, can acquire information from literature, databases, and other sources, utilize information technology and online resources, integrate acquired information, interpret it, draw conclusions, and formulate and justify opinions.		[SU1] Assessment of task fulfilment		

Subject contents	<p>LECTURES: Polish and international regulations concerning the quality and quantity protection of surface and groundwater. Water as a fundamental element of the environment, crucial for both humans and nature. Classification of the quality of surface and groundwater. The role of environmental protection services in ensuring the appropriate quality of these waters. Characteristics of basic sources of water pollution, the importance of point and non-point sources. Eutrophication of water as one of the main causes of surface water degradation. Description of the reasons for the occurrence of this phenomenon and methods to counteract eutrophication. Rehabilitation methods for surface waters: biological and technical. Inactivation of reactive phosphorus in sediments and water. Quality of rainwater and the applied methods for its purification. Renaturalization of surface water reservoirs. The significance of hydrophilic objects in the natural environment. The impact of anthropogenic pressures on aquatic biota. The Gulf of Gdansk as a surface water reservoir of particular economic and recreational significance. The role of the Helsinki Convention in shaping the water quality of the Gulf. The Tricity Agglomeration as the primary source of pollutants introduced into the Gulf of Gdansk and the Baltic Sea. Sewage and their treatment as the primary task of local governments to ensure the appropriate quality of water. Protection of bathing areas. Maritime transport as a potential source of water pollution. Rehabilitation of degraded surface water reservoirs.</p> <p>AUDITORY EXERCISES: Sources of inland and marine water pollution in the Gdansk region. Ecological factors of socio-economic development in the region. Analysis of the impact of the largest industrial facilities in the region on marine and inland surface waters. The importance of wastewater treatment and the methods of discharging treated wastewater into receivers. Phosphorus as a biogenic element. Phosphorus removal from surface waters - rehabilitation. Threats of microbiological contamination of surface waters.</p>		
Prerequisites and co-requisites	Knowledge from the subjects Chemistry (SSPK7), Environmental Protection (SSPK15), and Water and Wastewater Technology.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	exercise - task to be completed	55.0%	40.0%
	lecture test	55.0%	60.0%
Recommended reading	Basic literature	<ol style="list-style-type: none"> 1. *Laskowski R., Migula P.: Ecotoxicology from Cell to Ecosystem. Warsaw: State Publishing House for Agriculture and Forestry 2004. 2. **Pempkowiak J.: Outline of Marine Geochemistry. Gdańsk: University of Gdańsk Publishing 1997. 3. **Pyłka-Gutowska E.: Ecology with Environmental Protection. Warsaw: Oświata Publishing 1998. 4. **Sustainable Development in Policy and Scientific Research. Lublin: Scientific Papers 29. Polish Academy of Sciences Scientific Committee at the Presidium of the Polish Academy of Sciences: Man and the Environment. Lublin University of Technology 2001. 	
	Supplementary literature	Regulations and legal acts, as well as international reports, agreements, and treaties regarding water protection	
	eResources addresses	Adresy na platformie eNauczanie:	

Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> 1. Explain the concept of sustainable development. 2. What does the term "uniform water bodies" mean? 3. Provide a method for classifying the state of uniform surface water bodies. 4. What elements are assessed when classifying the cleanliness of surface waters? 5. Give classifications of the ecological state of surface waters. 6. Based on what principles is water management carried out in Poland? 7. What are the instruments for water management in Poland? 8. Explain the concepts of transitional waters and coastal waters. 9. List the main sources of surface water pollution. 10. Explain the significance of air quality for water quality and the eutrophication process. 11. Provide reasons for the eutrophication process. 12. Explain the stages of the eutrophication process. 13. Explain the concept of internal loading and describe the mechanism and factors that trigger this process. 14. Explain the importance of thermal stratification in lakes in the eutrophication process. 15. Explain the significance of the sorption capacity of sediments in relation to phosphorus. 16. What does the term "reclamation" mean? 17. Provide the stages of the reclamation process. 18. On what basis is the choice of reclamation method made? 19. What does the term "internal loading" and "interstitial waters" mean? 20. List the methods and types of reclamation. 21. Enumerate the technical methods of reclamation. 22. Provide examples of reclamation with significant ecosystem intervention in water bodies. 23. Provide examples of reclamation with low ecosystem intervention in water bodies. 24. What does the removal of hypolimnetic waters involve, and when can it be applied? 25. Provide and briefly describe methods of phosphorus inactivation in lake reclamation. 26. Compare phosphorus inactivation in the water column and in sediment, and mention their advantages and disadvantages. 27. Explain the principle of reclamation through phosphorus inactivation in sediments. 28. What are the advantages and disadvantages of reclamation using dredging? 29. What does the term "aeration with stratification" mean? 30. What does the term "aeration without stratification" mean? 31. What are algal techniques, and where are they used? 32. In what situations and for what purpose are biological shoreline protection methods used? 33. When and where are technical shoreline protection methods applied? 34. What does the term "channelization" mean, and when and where is it carried out?
Work placement	Not applicable

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