

**Subject card**

<b>Subject name and code</b>	Water Protection and Restoration (Lecture), PG_00200867						
<b>Field of study</b>	Physical geography and geoinformation						
<b>Date of commencement of studies</b>	October 2026	<b>Academic year of realisation of subject</b>			2027/2028		
<b>Education level</b>	Master's studies	<b>Subject group</b>			Obligatory subject group in the field of study Optional subject group Subject group related to scientific research in the field of study		
<b>Mode of study</b>	full-time studies	<b>Mode of delivery</b>			at the university		
<b>Year of study</b>	2	<b>Language of instruction</b>			English		
<b>Semester of study</b>	3	<b>ECTS credits</b>			2.0		
<b>Learning profile</b>	academic	<b>Assessment form</b>			credit		
<b>Conducting unit</b>	Centrum Monitoringu i Ochrony Wód -> Faculty of Oceanography and Geography -> Rector						
<b>Name and surname of lecturer (lecturers)</b>	<b>Subject supervisor</b>		prof. dr hab. inż. Julita Dunalska				
	<b>Teachers</b>						
<b>Lesson types</b>	<b>Lesson type</b>	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	<b>Number of study hours</b>	15.0	0.0	0.0	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		1.0		34.0	50
<b>Subject objectives</b>	Familiarization with the problems of water protection and restoration; preparation to take action to improve water quality.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[GFGMU2_U07] is able to efficiently perform, present and critically interpret the results of individual or group research, using a properly understood cause-and-effect sequence of the applied research procedure, visualizing the results of spatial data analysis and reliably documenting own contribution to the conducted procedure	Has the ability to analytical and synthetic reasoning the obtained environmental data and on their basis propose methods of restoration. Understands the opportunities and threats to the implementation of the proposed activities.	[SU1] oral statement/conversation/discussion [SU5] implementation of a problem task
	[GFGMU2_W02] knows and understands to a deepened extent issues in the field of exact sciences enabling the understanding of complex processes and phenomena occurring in the Earth's natural environment, and in their interpretations consistently rely on empirical foundations, using qualitative and quantitative methods	Knows and understands the phenomena and processes occurring in surface waters; has knowledge of the principles of lake protection and restoration; defines methods for the water resources restoration.	[SW1] oral statement/conversation/discussion [SW5] implementation of a problem task
[GFGMU2_K02] is ready to active actions to raise awareness of changes occurring in the natural environment and their consequences, as well as initiating activities for the protection of the natural environment	When inferencing, it demonstrates the attitude of conscious and reliable assessment of the impact of human activities on the aquatic environment.	[SK1] oral statement/conversation/discussion	
Subject contents	<ul style="list-style-type: none"> <li>- Challenges and opportunities of aquatic ecosystems protection.</li> <li>- Methods and techniques of water protection and restoration (presentation of solutions implemented in New Zealand, Australia, Florida U.S. and Poland).</li> <li>- The concept of modern water protection and restoration in accordance with "Nature-Based Solutions" and "Circular Economy".</li> <li>- The role of "Citizen Science" in the planning of conservation and restoration activities.</li> </ul>		
Prerequisites and co-requisites	Knowledge of English		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	After confirming the implementation of learning outcomes, the student obtains a grade depending on the score obtained (51-60% - 3.0; 61-70% - 3.5; 71-80% - 4.0; 81-90% - 4.5; 91-100% - 5.0).	51.0%	100.0%
Recommended reading	Basic literature	- Cooke G. D., E. B. Welch, S. A. Peterson, S. A. Nichols. 2005. Restoration and management of lakes and reservoirs. Third edition. Boca Raton: Taylor&Francis.	
	Supplementary literature	<ul style="list-style-type: none"> <li>- Abell J. 2018. Ecofish - shallow lakes restoration review - final shallow lakes: A literature review. Waikato Regional Council Technical Report, 13.</li> <li>- Hamilton D.P, Dada A. 2016. Lake management: A restoration perspective. In: Advances in New Zealand Freshwater Science. Jellyman PG, Davie TLA, Pearson CP, Harding JS (Eds.). New Zealand Freshwater Sciences Society and New Zealand Hydrological Society Publishers, 531-552.</li> <li>- Jeppesen E., Søndergaard M., Jensen H.S., Ventäla A-M. 2009. Lake and reservoir management. Encyclopedia of Inland Waters, 295-309. - Klapper H. 2003. Technologies for lake restoration. J. Limnol., 62(1): 73-90.</li> </ul>	
	eResources addresses		

Example issues/ example questions/ tasks being completed	Analysis of lake restoration techniques
Work placement	Not applicable

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