

Subject card

Subject name and code	Valorisation of water resources, PG_00135501						
Field of study	Physical geography and geoinformation						
Date of commencement of studies	October 2024	Academic year of realisation of subject				2024/2025	
Education level	postgraduate studies	Subject group				Obligatory subject group in the field of study	
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					
Conducting unit	Pracownia Limnologii -> Katedra Hydrologii -> Faculty of Oceanography and Geography						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Kamil Nowiński				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	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		15.0		30.0	60
Subject objectives	1. Recognize the conditions of water in the environment.2. To identify the types of water resources and their importance in water management.3. To gain knowledge about the functioning of rivers and lakes and their role in the natural environment.4. Functions and economic importance of lakes, methods of their protection and restoration.5. to discuss the renewability of water resources in the hydrological cycle						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[GFGMU2_W01] the specificity of Earth sciences in the field of physical geography, its internal structure, research subject and main research directions, conceptual apparatus, as well as practical applications of scientific achievements	Knows and understands the conceptual apparatus, as well as the practical applications of scientific achievements in the valorization of watercourses and lakes	[SW4] test/exam - oral or written
	[GFGMU2_U03] effectively use selected scientific literature in the field of physical geography and geoinformation, both in Polish and English	Can effectively use skillfully selected for the purpose of application scientific literature in the field of water resources valorization in Polish, as well as in English	[SU4] test/exam - oral or written
	[GFGMU2_K03] accepting responsibility for group work assuming various roles in it, participating in preparation of scientific projects, taking responsibility for the equipment and safety rules, active developing of professional competences and knowledge in Earth and environmental sciences and geoinformation, including interdisciplinarity, as well as developing the principles of professional ethics, respecting copyright rules	He is ready to actively expand his professional competence and update his hydrological knowledge enriching it with an interdisciplinary dimension, observing and developing the principles of professional ethics, including respecting copyrights in his own and others' activities	[SK4] test/exam - oral or written
	[GFGMU2_U05] integrate knowledge from the discipline of Earth and environmental sciences, explaining and interpreting the interrelationships between environmental processes and phenomena in order to solve research problems in physical geography and geoinformation	Is able to integrate knowledge from the discipline of earth and environmental sciences, correctly explaining and interpreting the interrelationships between environmental processes and phenomena in order to solve research problems of modern hydrology in the context of valorization of water resources	[SU4] test/exam - oral or written
	[GFGMU2_W08] the most important contemporary problems on a regional and global scale, their essence, genesis and possible consequences	Knows and understands the most important problems of threats to the water environment on a regional and global scale, their nature, genesis and possible consequences	[SW4] test/exam - oral or written
	[GFGMU2_U02] precisely and appropriately use terminology in the field of physical geography and geoinformation in oral statements and written works	Fluently and appropriately apply the terminology of hydrology in oral statements and written work	[SU4] test/exam - oral or written
	[GFGMU2_W02] 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 issue of pollution of surface water and groundwater consequences, and in their interpretation and valorization	[SW4] test/exam - oral or written
	[GFGMU2_K01] critical assessment of knowledge in the field of Earth and environmental sciences and geoinformation, its completion and verification through critical analysis of scientific literature	He is ready to critically evaluate his knowledge of water resource valorization, to supplement it and to verify his knowledge and skills by critically reading the literature on the subject	[SK4] test/exam - oral or written

Subject contents	<p>Types of water resources static and dynamic resources. Water needs of various branches of the economy (including therapeutic mineral water, thermal water) and the population taking into account the concept of inviolable flow. Water-economic balance. Natural and disposable water resources of the catchment area. Quality of surface and groundwater water bodies. Eutrophication of waters and its consequences. Lake restoration methods and their effectiveness. Hydromorphological valorization of watercourses (RHS). River and lake systems. Water-dependent ecosystems determinants of water management. Quantitative and qualitative threats to water resources. Small-scale retention. Hydrological land reclamation and its effects. Water erosion of soils and its prevention. Hydrological role of forest. Regional differentiation of water resources in Poland areas of water surplus and shortage. Water management systems and instruments of water resources management. Good practices in water resources management in a catchment area.</p>		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
Recommended reading	Written exam with open and closed questions (tasks)	51.0%	100.0%
	Basic literature	<p>Ciepielowski A., 1999, Basics of water management. SGGW, Warsaw, Poland. Lampert W., Sommer U., 1996, Ecology of inland waters. PWN, Warsaw. Mikulski Z., 1999, Water management. PWN, Warsaw. Wetzel R.G., 2001, Limnology. Lake and River Ecosystems. Elsevier, San Diego, London.</p>	
	Supplementary literature	<p>Bajkiewicz-Grabowska E., 2002, Circulation of matter and energy in river and lake systems. UW, Warsaw. Borowiak D., 2011, Optical properties of lake waters of Pomerania, UG, Gdansk. Fac-Beneda J., Bogdanowicz R. (eds.), 2009, Water resources and protection. Circulation of water and matter in river catchments. FRUG, Gdańsk. Jereczek-Korzeniewska K., 2009, Hydromorphological valorization of watercourses of the Puck Plateau and the Framework Water Directive [in:] Bogdanowicz R., Fac-Beneda J. (eds.) Water resources and protection: circulation of water and matter in river catchments. FRUG, Gdansk: 122-127. Kajak Z., 1979, Eutrophication of lakes. PWN, Warsaw. Lidzbarski M., 2015, Identification of the groundwater circulation system in the process of establishing renewable resources on the example of the Reda and Zagórska Struga catchments. Geological Review, 63: 893-900. Mioduszewski W., Dembek W. (eds.), 2009, Water in rural areas. IMUZ, Warsaw, Falenty. Paczyński B., Sadurski A., 2007, Hydrogeologia regionalna Polski: Tom I Wody słodkie, Tom II Wody mineralne, lecznicze i termalne oraz kopalniane. PIG, Warsaw. Sobolewski W., Borowiak D., Borowiak M., Skowron R., 2014, Database of Polish lakes and its use in limnological research. UMCS / Picador Graphic Communication, Lublin-Lubartow. Szoszkiewicz K., Zgoła T., Jusik S., Hryc-Jusik B., Hugh Dawson F., Raven P., 2012, Hydromorphological assessment of flowing waters, Handbook for field studies according to the River Habitat Survey method in Polish conditions. Bogucki Wydawnictwo Naukowe, Poznań-Warrington.</p>	
eResources addresses	Adresy na platformie eNauczanie:		

<p>Example issues/ example questions/ tasks being completed</p>	<p>Definition of water resources.</p> <p>Water resources (actual, inviolable, disposable).</p> <p>Limnological succession and trophic status assessment of lakes.</p> <p>Water crisis. What measures should be taken to reduce the water deficit?</p> <p>Methods of hydromorphological valorization of rivers.</p> <p>Limnological typologies.</p>
<p>Work placement</p>	<p>Not applicable</p>

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