



## Subject card

Subject name and code	WATER MANAGEMENT AND FLOOD PROTECTION, PG_00044231						
Field of study	Civil Engineering						
Date of commencement of studies	October 2021		Academic year of realisation of subject		2024/2025		
Education level	first-cycle studies		Subject group		Optional subject group		
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	4		Language of instruction		Polish		
Semester of study	7		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Hydraulic Engineering -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Tomasz Kolerski				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	0.0	0.0	0.0	30
	E-learning hours included: 0.0						
	Address on the e-learning platform: <a href="https://enauczanie.pg.edu.pl/moodle/index.php?id=8949">https://enauczanie.pg.edu.pl/moodle/index.php?id=8949</a>						
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	30		5.0		15.0	50
Subject objectives	Introduction of the students into the questions of water management and flood protection.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W09] knows the principles of determining of loads acting on basic constructions (e.g. general, industrial, bridge, water, marine, transport objects) and rules of its constructing		The student knows the rules for determining the loads on selected hydrotechnical structures		[SW3] Assessment of knowledge contained in written work and projects		
	[K6_U07] Can design and properly dimension basic elements of construction or basic foundations of general, hydrotechnical and bridge constructions		Student can design weir opening, energy dissipation basin, crest of the embankments		[SU1] Assessment of task fulfilment		
	[K6_U17] has specialized skills in civil engineering within offered specialization		The student has specialized skills in the field of water management and flood protection		[SU3] Assessment of ability to use knowledge gained from the subject		
	[K6_W16] Has deeper and adequate knowledge of civil engineering, within offered specialization		The student has an in-depth knowledge of water management and flood protection		[SW1] Assessment of factual knowledge		
Subject contents	Basic definitions . Water resources, water management tasks . Water Law and administration of water resources. Fundamentals of hydrology : precipitation , the amount of precipitation in Poland and worldwide . The runoff from the catchment , infiltration , runoff components of the total outflow from catchment . Effective rainfall , surface runoff , the impact of urbanization on runoff from the catchment. The flow in the rivers: water levels and discharges , the rating curve $Q(h)$ , steady flow , channel with compact and compound cross-section , unsteady flow , flood wave propagation in open channels , extreme flows . Floods and their roots, the floods in Poland. Retention reservoirs and their functions , flood control reservoir design, storage equation , transformation of flood wave through the reservoir . Controlling the outflow from the reservoir during the flood wave transition . Retention reservoirs in Poland and in the world . Flowing over the floodplain area . Flood : the role of the dikes , the principles of their construction and maintenance , failures of dikes. Flood wave propagation on dry floodplain caused by the failure of the dike.						
Prerequisites and co-requisites	Basic knowledge dealing with computer application. Knowledge of the subject Hydraulics and Hydrology						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	final test		60.0%		50.0%		
	Practical exercise		60.0%		50.0%		

Recommended reading	Basic literature	<p>1. Ciepielowski A.: Introduction to water management. Wydawnictwo SGGW, Warsaw 1999</p> <p>2. Kubrak J., Nachlik E. (red): Fundamentals of open channels computations. Wydawnictwo SGGW Warsaw 2003.</p> <p>3. Kolarski T. Praktyczne aspekty gospodarki wodnej w projektowaniu zbiorników retencyjnych, Wydawnictwo Politechniki Gdańskiej</p>
	Supplementary literature	<p>1. Szymkiewicz R., Gąsiorowski D.: Introduction to dynamic hydrology. WNT Warsaw 2010</p> <p>2. Tuszek A. (red.): Fundamental problems in modern technics; vol. XXIV Water in national economy. PWN Warsaw 1985</p> <p>3. Wołoszyn J., Czamara W., Eliasiewicz R., Krężel J.: River training. Wydawnictwo AR Wrocław 1994</p>
	eResources addresses	<p>Podstawowe</p> <p><a href="https://www.researchgate.net/publication/263043106_Praktyczne_aspekty_gospodarki_wodnej_w_projektowaniu">https://www.researchgate.net/publication/263043106_Praktyczne_aspekty_gospodarki_wodnej_w_projektowaniu</a> - the handbook can complement the available studies in the fields of water management, hydrology and reservoir design. My goal was to present in a clear and logical manner the complex problems related to the design of water reservoirs and other issues in the field. Each of the discussed issues is illustrated with examples that readers may try to solve on their own or relate the proposed procedures to a similar task that they will have to face in their engineering practice.</p> <p>Adresy na platformie eNauczanie:</p> <p>Gospodarka wodna i ochrona przeciwpowodziowa 2024 - Moodle ID: 41647</p> <p><a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=41647">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=41647</a></p>
Example issues/ example questions/ tasks being completed	<p>Steady flow in open channel with compound cross section.</p> <p>Analysis of the flood wave propagation through the reservoir.</p>	
Work placement	Not applicable	

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