



Subject card

Subject name and code	HYDRAULICS OF HYDRO-ENGINEERING STRUCTURES, PG_00041432						
Field of study	Civil Engineering						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2023/2024		
Education level	second-cycle studies	Subject group			Optional subject group Subject group related to scientific research 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			3.0		
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. Dariusz Gąsiorowski					
	Teachers	dr hab. inż. Dariusz Gąsiorowski					
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						
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		40.0		75
Subject objectives	Understanding and mastering the advanced level concepts and principles of water movement in civil engineering. Ability to formulate computational problems. Ability to determine the boundary conditions of objects. Use software components associated with the calculation of structures and water installations.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K7_W11] has deep knowledge of marine and inland hydrotechnical constructions; has knowledge about hydraulical and hydrological constrains in design and exploitation of buildings	The student correctly associate knowledge in the field of civil engineering with the specificity of hydraulics structures and systems.			[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects		
	[K7_W14] knows and applies building codes and obeys the Construction Law; has knowledge on environmental impact of investment realisation	The student can search appropriate legal provisions.			[SW1] Assessment of factual knowledge		
	[K7_U14] is able to plan and to interpret the geotechnical investigations, to analyse the foundation stability; can design direct and deep foundations in complex soil conditions for complicated statical and dynamical loads	The student knows the principles to design the foundations for hydro-engineering constructions.			[SU4] Assessment of ability to use methods and tools		
	[K7_W15] has deep and adequate knowledge of civil engineering, within offered specialization and profile	The Student has the ability to take a broad perspective on the problems in civil engineering.			[SW1] Assessment of factual knowledge		
Subject contents	Hydraulic load of water devices. The outflow by weirs, spillway and culverts. Hydraulics design of weirs, spillways and culverts. Design of energy dissipation structures. Hydraulics of siphons and inverted siphons. Determination of water surface profiles in the area of bridge piers and weirs. Hydraulics design of retention reservoir. Operation of the retention reservoir and the outflow structures in unsteady flow conditions. Water filtration flow through embankments and under a damming structure. Elements of physical modelling of hydraulics.						
Prerequisites and co-requisites	Basic course in fluid mechanics and hydraulics.						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Homework	60.0%	50.0%
	Test	60.0%	50.0%
Recommended reading	Basic literature	1. Chanson H.: The hydraulics of open channel flow, Butterworth 2001. 2. Chadwick A., Morfet J.: Hydraulics in civil and environmental engineering, E&FN Spon, London 1999.	
	Supplementary literature	1. Szymkiewicz R., Huang S., Szymkiewicz A.: Introduction to computational engineering hydraulics, Gdańsk University of Technology, Gdańsk 2016.	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	Determination of hydraulic jump parameters to design the stiling basin. Determination of critical depth and the rating curve in a circular culvert.		
Work placement	Not applicable		